PHYSICAL EDUCATION IN RELATION TO SCHOOL LIFE

REGINALD E. ROPER

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PHYSICAL EDUCATION *in* RELATION *to* SCHOOL LIFE

A STATEMENT OF PRESENT CONDITIONS AND FUTURE NEEDS

BY

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AUTHOR'S NOTE

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INTRODUCTION

GROWTH and health are natural human qualities. Given good conditions and reasonable environment they are within the reach of almost all: under adverse conditions they are not.

Public and private endeavour (under the direction of authorities, committees, societies, philanthropic and otherwise, and backed by a vast expenditure of private and public money) aim at counteracting varied symptoms of lowered vitality more than half of which are directly or indirectly the results of environment. The work would be enormously assisted by a public conscience, a sense of communal responsibility for the conditions which to-day render existence insecure. Such a sense can only be based upon a knowledge of physical needs and an individual acquaintance with the sensation of bodily well-being which we call fitness or health. To be effective, these must be acquired during school life.

In this book the problems of growth and health are viewed in their relation to education. Conditions which experience leads me to believe most adverse to their solution are examined: the main outlines of a satisfactory physical education are indicated. I have compared the aims and objects and appreciated the practical value of some of the better-known methods of dealing with the question, and have suggested the direction in which future improvement may most usefully be sought.

The physical side of school life is worthy of more detailed consideration than has at present been accorded it by any Education Authority in this country. In general, whilst theories of growth and health are accepted without demur, their practice is in most schools looked down upon by the rest of the teaching staff. Their failure to appreciate the importance of the subject is not merely a heavy handicap upon those in charge of the physical well-being of the children: it is directly responsible for a national loss.

If even to a small extent I have succeeded in establishing the claims of physical education to a fair share of the time-table, and to a fuller recognition of its value at the hands of those responsible for educational organization and training, it is due to the inspiration of Professor Törngren, once Director of the Royal Central Gymnastic Institute at Stockholm, and—in the memory of those who knew him—an educationist in the highest sense.

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Physical Education in Relation to School Life

CHAPTER I

SCHOOL LIFE AND PHYSIQUE

In order to prepare them as far as possible for the struggle for existence, children are sent to school. The mental gain is accepted as justifying this course of action. What is the effect upon their physique?

It is necessary to make clear at the outset that it is not enough to prove that children in any given school are up to the average of height and weight for the district in which their school is situated. Lists of average height and weight are compiled from measurements taken during at least the past ten or fifteen years, and though the conditions of school life are improved to-day they are not even yet such as to give the maximum or even a reasonable result in growth. Existing standards of physique too often serve to standardize existing conditions, and so long as parents and teachers are content to see children conform to a table of averages they tacitly accept the kind of conditions from which those averages were evolved.

The Need of Movement

The first and most important conditions of healthy growth are enough food, enough sleep, enough movement. In public and preparatory schools the first two are available, or at least capable of attainment. In elementary schools the financial value of child labour, the conditions of town life, or other circumstances varying with the situation of the school, may interfere with them. In every school, whatever the social position or the sex of the children attending it, the third condition—movement—is lacking. It is the bare truth that classroom life is the negation of movement. The amount of money available for building and staffing schools, the design of the buildings, the furniture of the rooms in which the work is done, the necessity of teaching many children in one room at one time by one person, the generally accepted idea that a quiet class is an attentive one, the inability of the ordinary teacher to permit even possible movement for fear of destruction of discipline, these and many other conditions of school life impose artificial restrictions upon that movement without which healthy growth is impossible.

The extent to which town life is becoming sedentary or restricted in movement for many is remarkable. We sit down on the way to work, in trains or trams : we sit in offices : we sit in the evenings at home or in picture palaces or theatres. (Where movement is a necessary part of work, as in factories or shops, it is often so restricted and so exaggerated in its effects by long hours as to produce a specialized form of movement which is, after all, neither more nor less than an extended or prolonged position, the health-giving or corrective result of which is non-existent.) The sitting position is becoming typical of large classes of the population, differentiating them from the rest almost as clearly as the erect position distinguishes man from animals. It has certain definite characteristics and direct consequences which are examined in detail in another chapter: for the present it will be sufficient to note it as the restraint of movement most typical of school life.

The parts of the school which permit of movement are the corridors, the gymnasium, the playground, and the playing-fields. The first, in which motion must be orderly and restrained, may be ruled out: the other three alone remain to provide proper conditions for growth, until such changes in the methods of handling classes take place that mental training may proceed without direct interference with physical needs. By gymnasium I mean the room or floor-space devoted to any form or system of organized movement, whether British, Danish, German, or Swedish gymnastics (with or without apparatus), Folk or Morris dancing, ballroom dancing, or Eurythmics: by playground, the space in the open air (enclosed, or as in some country or crowded town areas, the road or street) in which the children play games in connection with the school time-table: by playing-fields, those owned by the school or provided by the local authority. It is on these areas that the effects of restriction of movement are to be counteracted. I propose to examine later the main forms and systems of movement employed, and their value as counter-agents.

THE PHYSICAL RESULTS OF SCHOOL LIFE

No hard-and-fast line can be drawn between physical and mental education. For normal children lessons are more mental than physical, and vice versa: with abnormal or subnormal children the distinction is less clear. The case of a child who is blind and deaf, and is compelled to learn to speak (by its sense of touch) from the throat and lips of its teacher, is an obvious though exaggerated example of the value of movement in education. In another chapter I have referred to one or two cases of children, by no means subnormal or abnormal, whose difficulties in mental and physical work were obviously the results of a common cause. It is, perhaps, inaccurate, and certainly unwise, of the advocates of some of the later developments of education through movement to claim that only by their special teaching can the fullest development of individual expression be obtained. The single-minded, not to say fanatic, enthusiast for physical education will always be confronted by instances of inferior physique and superior mentality: he will for ever be called upon to explain the inferior mentality and superior physique of the child whose gymnastics and games are beyond reproach, but whose written work is far below the average of attainment. These are, however, special cases: for the present we may confine ourselves to the consideration of conditions favourable to normal healthy growth.

Those who are engaged in education are faced by two facts. First, a definite state (not confined to the staff) known as end-of-termishness, exists: whether in day or boarding school the progress of the term shows a gradual decrease in physical vitality as surely, if not more surely, than an increase in mental ability. This is not as it should be, for if a term be regarded as a period of growth, as a part of life, those who go to school should leave at the end of term fitter than when they began. Second, during the period of school life, children—from the time they leave their beds till they return to them again—maintain the sitting position for an average of at least six hours, or 25 per cent. of the day. This is a moderate estimate: in some cases it may be less, in others it can amount to eight hours or more. A detailed analysis of the position and its consequences may establish a connection between it and the lowered vitality so common at the end of term.

CHAPTER II

THE SITTING POSITION

Its Effect upon the Habit-length of Muscles and Consequent Skeletal Balance

In order to appreciate the effect of the sitting position upon muscular balance (i.e. the relative length and tone of antagonistic groups of muscles), it must be remembered that muscles as well as other parts of a living body tend to adapt themselves to an habitual position. A simple example is the elbow and the muscles which operate it, when for a broken collar-bone the joint is immobilized for some time. The muscles concerned not only become weakened owing to lack of movement, but their actual length tends to adapt itself to the new position, an effect which afterwards has to be counteracted by massage and special movements.

The effects of the sitting position are numerous and somewhat complicated. It is usual to regard them as more or less confined to the chest and upper portion of the spine. I have classified them in inverse order, from below upward, having regard to the resultant changes in the erect position, and have arranged them as follows :—

Effects of sitting position
- I. During maintenance of the position
- II. On resuming the erect position
  - A. Below pelvis
  - B. Above pelvis
    - (i) Abdominal
    - (ii) Thoracic
    - (iii) Cervical

In considering alterations of position of the spinal column, I would lay more stress upon sagittal than lateral curvature. A certain amount of departure from the vertical in a lateral direction is so common as to be almost normal. Taken into consideration in connection with sagittal displacement (hollow back, round back) it is of course important even in the earlier stages. But in attempting to analyse the effects of prolonged sitting upon general vitality it is more useful to concentrate attention upon sagittal changes. As Dr. Patrick Haglund has observed, in a monograph upon the physique of children in elementary schools in Stockholm, the effects of these changes upon general vitality are far more marked than those of the majority of lateral curvatures; these he regards more as *skõnhetsfel* or *manques de beauté* than serious causes of ill-health.

In the following analysis I have considered the sitting position to be one in which the lower leg is vertical, the thigh horizontal, and—except in B. (i) (ii) (iii)—the spine vertical.

I. *During maintenance of sitting position*. A. Below pelvis.—The relative position of the bones of the foot and the lower leg may be taken as being—on an average—so nearly that of the middle position between full flexion and extension that the resultant changes of muscular length are inconsiderable. When, however, we consider the knee-joint flexed, with the lower leg at right-angles to the thigh, an alteration in muscular length is at once evident. The extensors of the knee are to some extent stretched—they are at least not in their shortest position. Being so much exercised as soon as the erect position is resumed, their length is more or less corrected. In addition they are affected differently. Those which have their origin upon the femur (the group of vasti) are somewhat lengthened: the rectus femoris is shortened when the femur is passively flexed upon the pelvis: the sartorius is shortened both by this and by the flexion of the knee.

It is otherwise with the flexors of the knee. The gastrocnemius, popliteus, and—where it occurs—the plantaris, have their origin and insertion brought nearer to each other, and thus are not compelled to maintain their normal length. The result is felt at once on making an attempt to touch the toes with the fingers without bending the knees. The semi-membranosus, biceps femoris, semi-tendinosus, gracilis, also have their origin and insertion brought nearer to each other, with the same result. Some relief is obtained when the legs are stretched out under the desk or table, but the general effect of the sitting position upon the flexors of the knee is to shorten them.

The relief by change of position thus obtained is not possible in the case of some of the muscles which flex the femur upon the pelvis. The distance between origin and insertion is lessened in the case of the sartorius, the rectus femoris, the tensor fasciæ latæ, pectineus, adductor longus, and ilio-psoas. With the latter especially, as soon and as long as the sitting position is assumed, the origins and insertions are brought nearer to each other. Temporary relief, obtained by other muscles through movements of the legs whilst sitting, does not affect it appreciably, since until the erect position is again assumed the femur remains horizontal. The effect upon the relative position of the femur and pelvis and — through this — upon general carriage is examined below in section II.

During maintenance of position, B. (i). Above pelvis.—The average position considered hitherto, with lower leg vertical, thigh horizontal, spine vertical, is now changed in one important detail. The spine does not remain vertical. The longer the position is maintained the greater is the tendency (unconscious at first) to droop forward (see Plate 3, Chapter IV). This is due to the position of the weight to be supported (partly of abdominal contents, partly of the chest and the head) in front of instead of around the column of support. If the spine ran from the centre of the pelvis through the middle of the abdomen and chest, ending below the centre of gravity of the head, there would be little or no tendency to stoop. As it is, the mechanical support is arranged in the shape of the letter E, the lower horizontal stroke being the pelvis, the middle the lower ribs, and above the upper one the weight of the head. The vertical support, far from being a strong rigid bone, such as the femur, is a flexible column, depending for its resistance to a forward droop upon the muscular stays arranged on the side away from the horizontal lines. Reference to the diagrams of three sitting positions (Plates 3, 4, Chapter IV) shows how the forward droop is in each case accompanied by a rolling backward of the pelvis upon the points of support, in an attempt to balance the weight above these points, and to gain increased pull and lessened effort for the spinal muscles.

As far as the lumbar spine is concerned, it may remain almost vertical, or curve convexly backward ; it will rarely curve convexly forward in the sitting position. The lumbar portion of the erectores spinæ are very strong : the work they get in this position tends to strengthen them still further. It is otherwise with their antagonists. Disregarding for the present the complex nature and direction of the abdominal muscles, and taking a schematic view of their work, they may be classified as follows. The rectus abdominis is a flexor of the lumbar spine (through its attachments above and below to the ribs and pelvis) : the obliquus externus and internus of the left side, with the quadratus lumborum of that side, together form a group of side flexors of the trunk to the left : the corresponding group of muscles on the other side are flexors to the right, and the lower portion of the erectores spinæ acts as an extensor. The sitting position at once relaxes all these except the last group, upon which it throws extra work. There is, in consequence, a complete destruction of muscular balance in this region. The soft mass of the abdominal contents in part rests upon and in the pelvic basin, in part sags forward and downward as far as the relaxed abdominal walls permit.

I. B. (ii). The changes of position of the walls of the chest are more obvious. In the first place, the spine continues its forward droop : each vertebra is slightly bent forward upon the one below it : the space between them becomes less in front and greater behind. The intervertebral discs tend to become more wedge-shaped. The whole mass of the spinal muscles is stretched somewhat at every stage of its length—each part of it tends to assume a position between maximum and middle length. Not only are the muscles affected : the ligamenta flava and supraspinale are stretched, the ligamentum longitudinal anterius is relaxed. The sternum assumes a more vertical position—not in relation to the spine, but to the horizontal plane. The more vertical its direction the less is the movement of the ribs attached to it. Breathing becomes less costal—at any rate in the upper region—and more markedly diaphragmatic or "abdominal." In extreme cases movement of the upper three or four ribs almost completely disappears. The ribs are pressed downward upon each other, and the intercostal muscles have a habit-length of less than normal.

With regard to the shoulder-girdle: the muscles attaching the scapulæ to the spine are stretched, and lose tone: the shoulder-joints describe an arc forward, the pectoral muscles assume a shortened habit-length, and the weight of the arms tends to slide forward towards the front of the chest. The whole position of the shoulder-girdle changes and moves forward, and there is in consequence a further interference with respiration and a further tendency to stoop.

I. B. (iii). The cervical spine completes the sagittal curve, which now is concave forward from the last lumbar to the first cervical vertebra.

It is unnecessary to consider in detail here the further lateral curvature of the spine, rotation of vertebræ, etc. It is enough to point out the restriction of respiration (particularly in the upper portion of the chest) during the maintenance of the sitting position. Several further details are, however, worth mention. (i) The gradual droop forward of the body owing to the child's inability to resist the unfair strain upon muscles which should keep the spine erect, together with the rotation forward upon the left side so as to take up the position for writing, brings the ribs nearer and nearer to the edge of the table or desk until they finally touch and rest on it. The spinal muscles are then relieved of some of the insupportable strain, but at what cost? A great part of the weight of skull, brain, neck, shoulder-girdle, and upper part of chest is then supported through and by the ribs touching the desk, and the more perfectly the desk fits the child the more certainly does this new pressure come over the region of the heart. (ii) Another method of relieving spinal fatigue is to rest the elbows on the desk. This is not worse in its consequences than a prolonged effort to maintain a theoretically correct sitting position ; it may even be better. It is certainly to be preferred to touching the desk with the ribs, and has—I think —received an undue amount of attention as a harmful posture. (iii) The strain upon the spinal muscles becomes so great, and the changes in skeletal position so pronounced, that it is useless to expect a child to "sit up straight" with muscles which are unable to take or to maintain such a position. If this were generally recognized, much futile nagging might be avoided (cf. Chapter IV, Plate 12).

The general effect of the sitting position may be summarized as follows. There is a lessened mobility of the chest, with a consequent interference with the proper oxygenation of the blood. There is a relaxation of the abdominal walls, with a consequent loss of tone in the abdominal muscles and interference with the processes of digestion. It is unnecessary to consider here the nervous strain due to enforced lack of movement during class, the absorption of vital energy in mental processes, the unequal and often prolonged eye-strain, etc. Though they count in the sum of effort they are better considered under classroom organization. It is enough to point out again that **the sitting position is assumed for at least six hours a day, i.e. for 25 per cent. of school life, or one-quarter of a large portion of the period of growth.**

II. *On resuming the erect position*, A. Below pelvis.—The shortening of flexors of the knee is not responsible for much change in the straightness of the joint in the standing position. It shows more clearly in walking, when it prevents a full extension of the knee, and thus shortens the stride to a greater or less extent.

A more obvious change is noticeable in the position of the pelvis in the erect position. Now that the weight of the body is supported on the feet, and the thigh is again vertical, the pelvis may be considered as rotating backward or forward about a horizontal axis between the heads of the femurs : the muscles which flex the thigh upon the pelvis are to be considered (when the thigh is fixed) as flexing the pelvis upon the thigh. These muscles, like others, have tended to adapt themselves to a habit-length, and have become shortened. In consequence the pelvis is dragged forward-downward, the symphysis pubis being lowered and the sacrum correspondingly raised. The cross-section of these muscles is large, and the pull they are capable of exerting is very great. The new pelvic slope causes changes in the relative position of internal organs (cf. Chapter VI, p. 79) : it also determines the initial direction of the lumbar spine.

II. B. (i) (ii) (iii) Above pelvis.—During sitting, the balance of strength of the flexors and extensors of the lumbar spine has been displaced, and the extensors have become stronger than the flexors. The whole body adapts its relative positions so as to carry the head as erect as possible. Since the new pelvic slope compels the lumbar spine to start off at an increased angle forward, the rest of the spinal column has to adapt itself to the new conditions. It is impossible to obtain in the dorsal spine more than a limited amount of backward curve, i.e. concave backward, and what movement of this kind is possible has been further restricted by the forward stoop. In consequence, accommodation takes place in the lumbar and cervical region, the amounts varying with different individuals. In some it is obtained by a remarkable "hollowing" of the lumbar spine, so sharp as to be a constant source of weakness and pain (cf. Chapter IV, Plate 6). In others it is obtained almost entirely in the cervical spine, the head being thrown sharply backward. The majority show a definite "hollow back" and a more or less "poking chin."

The spine being vertical only as the result of a sum of opposed curves, any marked curve in one direction will produce a compensating curve in another. The hollow (lumbar) spine thus tends to produce a round (dorsal) spine, already produced, exaggerated and to some extent made rigid by prolonged sitting. The relaxed abdominal muscles offer little resistance, and the whole position becomes a vicious circle of interacting cause and effect.

The results of prolonged sitting are lamentable for all children. The inattentive and restless escape more easily; the dull, the conscientious, and the brilliant suffer more. The boy suffers less than the girl, by reason of the greater out-of-school activity expected of him. The girl is further handicapped by conventions of dress. I have attempted to show more in detail the results to her vitality in the section dealing with the relative strength of girls and boys (Chapter VI).

CHAPTER III

THE MEASUREMENT OF GROWTH

Some Drawbacks to Existing Tables of Growth.

GIVEN reasonable conditions of life, and assuming that at birth a child is reasonably healthy, it may be expected to follow certain more or less definite curves of increase in height and weight. The usual examples of these show clearly the difference between the rates and amount of growth of the town child and the public school boy : they differentiate between the boy and the girl, the man and the woman. As far as they go, they provide interesting and useful information. In the graphs illustrating this chapter I have indicated some of them for purposes of comparison with others drawn up under more advantageous conditions. I would, however, again point out that the vast majority of the measurements upon which the usual curves are based are those of children whose school life has not provided them with an effective antidote to the school desk and its consequences. Even in schools where games are possible and are well played, it by no means follows that these effects are counteracted (cf. Chapter IV, Plate 5). On the contrary, I have seen cases in which games accentuated them. Only those schools in which a room with suitable apparatus is provided, in which the gymnastic lesson is given a fair share of the time-table, and *in which the staff make every effort to assist those responsible for the physique of the children*, can hope at present to combat successfully the weakening and distorting results of enforced lack of movement. This will continue to be the case until a drastic revolution has been effected in the design of school furniture, in the methods of class organization and control employed by the average teacher, *and in the number of children per class.* (I am referring here not to gymnastic classes alone, but to the ordinary work of school.)

It may at once be admitted that measurements, however accurate, give no more information as to the health or tone of the individual measured than a detailed list of inches or millimetres may hope to give of the beauty of a statue. The work of one responsible for physical education in a school is to all intents and purposes a living sculpture, a modelling of bodies. Without the eye to see a curve, to note a wrong shape, even the most accurate system of measurements is useless. Accuracy, too, is merely a relative term: absolute accuracy of measurement of a chest is impossible. Respiration varies from day to day, from second to second. It is possible to obtain a different result in three consecutive breaths. Height may vary and a minus reading occur: a spinal curve developing, or the collapse of the arch of a foot, or a change in the time of day at which the measurement is taken may cause such a variation. Weight is easier to control and less liable to small and sudden change: here, however, an end-of-term measurement should be checked by an end-of-holiday examination: some children lose weight during term and gain in the holidays, and where they depend on the school for regular food the opposite may well be the case.

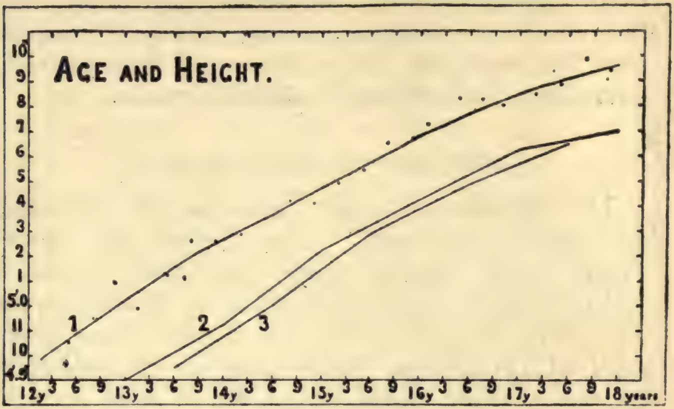
One is continually confronted with the question : "What ought I to weigh or to measure?" The answer too often is a reference to one of the accepted tables of averages. But since school life is for the most part an artificial existence, and its effects obviously interfere with growth, there can be no suitable answer obtained from such tables. To rely on them is merely to perpetuate the existing condition of things. It is for this reason that I have discarded the measurements I took at schools where gymnastic conditions were not satisfactory, and refer only to those I have been able to take where ordinary conditions of school life obtain, but good air, simple food, a fairly reasonable time-table, some attempt to secure sufficient rest, reasonably adequate provision for gymnastic lessons, and a sufficient though not professional amount of games, make it probable that the bodies of the boys have a fair chance of development—barring the desk and its effects. These latter I have attempted to counteract as far as possible : my aim has been to restore and maintain full capability of movement in every joint, and to ensure mobility of chest, and to encourage individual activity and interest. In some cases—even with the time at my disposal (three to four periods a week of half an hour—excluding time for changing clothes)—I have not been able to do more than continue the struggle against the desk-position and the orthodox methods of handling classes in the classrooms. Though in some cases the result is more zero than plus, it is at least not minus, and in some parts of the school the plus predominates. I much regret that I have been unable to obtain a common system of measurement for boys and girls : this would have provided interesting and perhaps valuable results.

METHODS OF MEASUREMENT

The measurements are taken at the beginning and end of each term. They include age, height, weight, chest (depth, width, and girth, maximum and minimum), and particulars as to feet and spine. The chest measurements are depth, from lowest point of breast-bone horizontally to corresponding vertebra ; width, from rib to rib at same level as depth, giving a diameter at right angles to it ; girth, at level of nipples, with arms by sides. I do not attach much importance to this last, except as corroborating generally the data obtained from the first two. The position of the shoulder-blades, the thickness and possible contraction of pectoral and other muscles, may distort the result, and the capacity of the chest be confused with what may prove to be the thickness of the sides of a box rather than its actual cubic capacity. I have not used a spirometer, as the time at my disposal is limited. The measurements are those of four terms, September 1913—December 1914.

EXPLANATION OF THE GRAPHS

Graphs 1 and 2 represent the usual age and height, age and weight, results. In the first classification I arranged the data according to age, taking a period of three months as a unit and obtaining the average of all measurements taken during—for example—the period of 14 years and 1, 2, 3

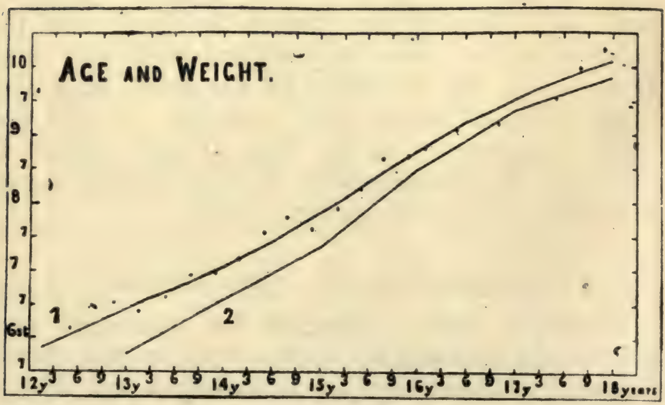


GRAPH No. 1.

Line 1.—Boys at Bedales School.

Line 2.—Average of male population, town and country, Great Britain.

Line 3.—Table of Growth, from "Adolescence," by Stanley Hall.



GRAPH No. 2.

Line 1.—Boys at Bedales School, in games clothes.

Line 2.—Average of male population, town and country, Great Britain, dressed.

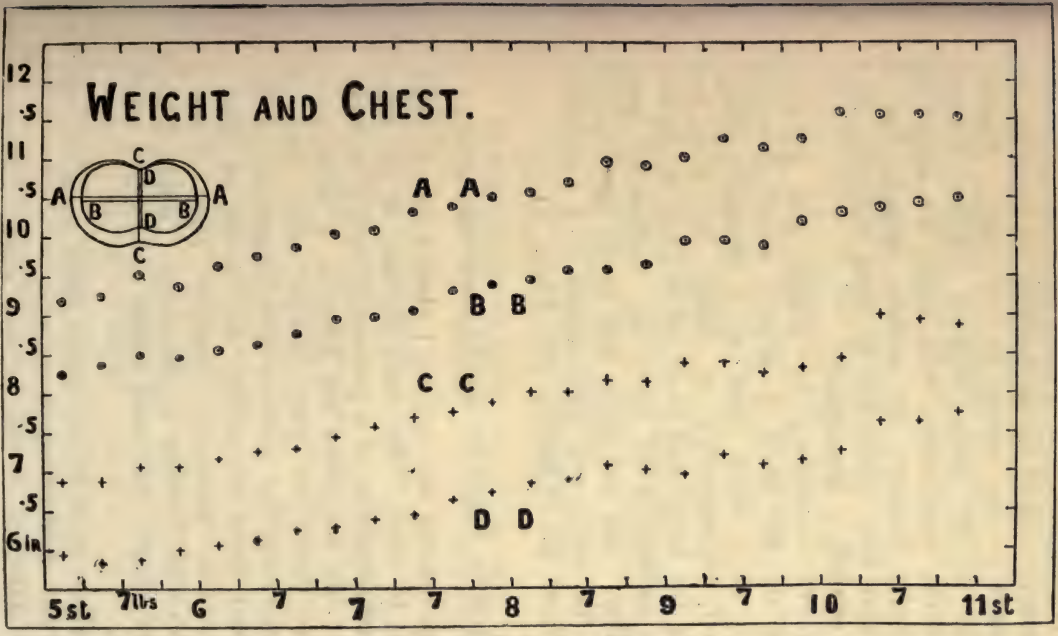
months, then the next average for 14 years 4, 5, and 6 months, and so on.

Mobility and Vital Capacity

I then grouped the averages obtained for depth and width of chest, according to the average height and weight for the three months units. This gave two sets of two lines each, the lower pair showing depth (inspiration and expiration), the higher pair giving width (inspiration and expiration). The rate of increase of actual measurement is slightly faster in the case of width than depth.

The actual number of inches of depth or width is, however, not so important as the difference between the maximum inflation and maximum deflation in each case. In considering either depth or width, attention should be directed to the space between the lines representing these maxima. If "vital capacity" has any connection with flexibility of chest, the space between these lines represents such capacity. The great similarity of the upper and lower line of each pair, allowing for occasional exceptions, is at once apparent, especially in those representing depth of chest. *So far from the shorter boy having the smaller "vital factor" (or difference between inspiration and expiration) it seemed that this factor varied so remarkably little as to be almost a common factor.* When grouped according to weight much the same result was obtained. On further consideration, however, it seemed possible that this striking apparent regularity might have been caused by the arbitrary selection of a three months unit as a basis of classification. I therefore discarded it entirely, rearranged the weights alone, and grouped them in units of 3½ lb., or four groups to the stone : I then averaged the corresponding measurements of depth and width of chest. (In a school where boys keep themselves and are kept "fit," where "training" for sports is not exaggerated and indeed hardly exists, and where diet is simple and nourishing, and extra "grub" and sweets are not allowed, it is fair to suppose that weight is usually the weight of healthy bone and muscles of a good tone : nourishment and weight will be closely connected, as also weight and mobility of chest.) Graph 3 shows the result : it is as striking as were the others, resembles them closely, and is free from the possible influence of the arbitrarily chosen three months unit.

It is impossible to conclude from the relatively small number of measurements I have taken that the difference between the maximum and minimum sagittal diameter of the chest is, or should be, nearly constant. It is, however, fair to assume that, where such a very small amount of movement is obtainable even under the best conditions, it is unwise to allow interference with that movement. It is more dangerous to interfere with a small margin of safety than with a large one. Now if mobility of the chest is to be taken as an index of vitality, anything which interferes with it may be assumed to predispose to loss of vitality. **No more direct or effective interference with a vital factor could be invented than is provided by the school desk.** The result upon the sagittal diameter of the chest is immediate, and in many cases the disadvantages of position are accentuated by direct mechanical pressure from the edge of the desk on the ribs, particularly on the left side. The more perfectly



GRAPH No. 3. (Unit of weight = 3½ lb.)

Line A A.—Maximum Inspiration, Width.
Line B B.—Maximum Expiration, Width.
Line C C.—Maximum Inspiration, Depth.
Line D D.—Maximum Expiration, Depth.

The vertical distance between the curves A A, B B represents mobility of chest in width; that between C C, D D in depth.

a desk is designed to fit a child the more accurately will pressure caused by his leaning his chest on the desk come in the region of the heart. Lateral curvature of the spine, with or without rotation of vertebræ, interference with sight, the alteration of muscular balance, are serious enough, but in comparison with restriction of chest mobility they are of secondary importance.

Note.—In attempting to regain and preserve mobility of the chest I always avoid directing attention to a *large* chest as a desirable thing. The evil consequences of fixing the ribs and straining the lungs and heart by holding the breath can be understood by even the smallest or most stupid boy. He can learn that to fix the chest is a fault for which one loses marks in a gymnastic examination (cf. Chapter IV, Plate 7).

FURTHER RESULTS OF CLASSROOM LIFE

Before leaving this subject I should like to draw attention to what I feel may be one of the most serious consequences of a prolonged sitting position. No one who has lived for long in a large town can have failed to come across some case of "consumption," and to have seen something of the precautions taken to prevent the spread of tuberculosis. The following extracts from Osler's *Principles and Practice of Medicine* (Tuberculosis) bring out clearly the main points to which I wish to refer.

"Dwellers in cities are much more prone to the disease than residents of the country."

"The influence of sex is very slight. Women are perhaps somewhat more frequently attacked than men, possibly from the fact that in a more sedentary indoor life they are more liable to infection."

"The frequent respiration of air already breathed appears to render the lungs less capable of resisting infection."

"How often is a neglected cold blamed as the starting-point of the disease. It seems to act by lowering the resistance and favouring the conditions which enable the bacilli either to enter the system or, when once in it, to develop."

Under the heading "Chronic Ulcerative Tuberculosis of the Lungs," he remarks :

"For years it has been recognized that the most advanced lesions are at the apices, and that the disease progresses downwards."

"This initial focus corresponds to a spot just below the centre of the clavicle."

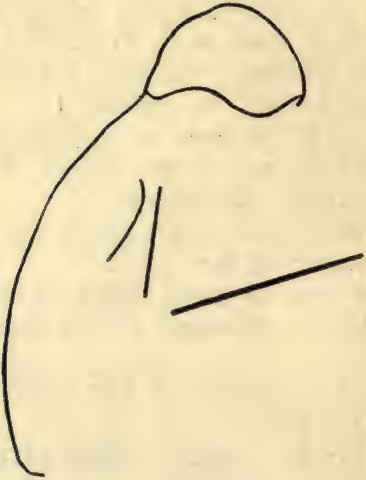
"Another type of chest which is very common is that which is flattened in the antero-posterior diameter."

"Defective expansion at one apex is an early and important sign."

"In by far the largest number of all cases the onset is with a bronchitis, or—as the patient expresses it—a neglected cold. There has been, perhaps, a liability to catch cold easily."

I have elsewhere referred to the statement of a head master, that one of the important results of a reasonable Physical Education was an increased ability to throw off minor ailments. From my own experience I know that children soon learn that a person with a cold is a nuisance and a source of trouble to the community ; also that regular daily breathing exercises enable one to avoid catching colds, and to throw them off when caught. It may be found that such a simple fact is as much worth teaching as that Henry VIII was frequently married.

Two of the phrases quoted above, "the frequent respiration of air already breathed," "a spot just below the centre of the clavicle," stand out from the rest, striking though the others are, with especial



vividness for one who has spent years teaching in a classroom. To me, the first gives the atmosphere of many rooms in which I have learnt and taught. The second brings to my eye the lines shown above. Whilst stooping, respiratory movements are larger in the lower and decrease toward the upper part of the chest, until in the majority of cases there is practically no movement of the upper ribs whatever. Movement in the upper portion of the lungs is proportionately restricted.

Is it too much to conclude that there is some connection between this enforced immobility (over long periods) during growth, and the facts quoted above? So long as classroom life remains what it is, it must connote interference with breathing. *Whether in town or country, a child sitting in a school desk is impairing the efficiency of its machinery of respiration, and lessening the antero-posterior diameter of its chest.* It is vain to insist upon a legal minimum of cubic feet of air per child, when at the same time, by the position we compel it to adopt and maintain, we directly lessen its power to use that air.

CHAPTER IV

THE PRACTICE OF PHYSICAL EDUCATION

The irreducible minimum for gymnastic lessons—apart from games, dancing, boxing, fencing wrestling, or other forms of physical activity—**is three lessons per week of half an hour.** This half-hour must not include time for changing clothes or shoes, but must be available for work. Before any specialized or applied form of exercise can be considered, these three lessons must be made sure, if classroom life is not to effect changes in muscular balance which it will later on be impossible to redress. The kernel of physical education is the formation—in many cases the reconstruction—of a correct muscular memory. By muscular memory I mean the sense of position, carriage, of the relative situation of the various parts of the body, derived from muscular sensation. For example, a child stooping over a desk, as in Plates 3 (position 3), 4 (position 3), or 12 (position 1), is conscious of sensations of muscular length and of fatigue in the muscles which should hold the spine erect. After a time he is moved to stretch himself: he then droops back again to his habit-position. Ultimately the idea of stooping is confused with that of sitting up (cf. Plate 3, figure 3, Plate 4), and what I have called his muscular memory is at fault. The faulty position is more readily assumed; it becomes habitual even when erect (Plates 5, 6, 7, 8, 9, 10): bones and joints continue to grow, and the position becomes normal.

Physical education has first of all to reconstruct the memory of a good position, so that the child—when he becomes conscious of stooping—will correct himself (Plate 12, figures 1 and 2). This is not readily done in less than a year; without apparatus it will take much longer. Having provided for the correction of such positions, the education may then proceed to stimulate healthy growth by suitable exercise. Both objects are best served by Swedish Gymnastics with proper apparatus. The order, arrangement, and progression of exercises are clearly laid down in the Handbook of Physical Exercises used in most Elementary Schools, and I need not specify them further here. It must, however, be pointed out that no apparatus work is described in this book, and none is done in most of the schools, since there is no apparatus available, and no money for its provision. Handwork and Science may have apparatus, but it is not, apparently, possible to provide it at present where the need is most pressing, viz. in the room or space devoted to growth. The book itself is a good practical introduction to the study of the subject, on a level perhaps with Hall and Knight's *Elementary Algebra*, and somewhat more advanced than *French without Tears*. To rely on a text-book in which apparatus work is not mentioned is much the same as to teach a child French or German without conversation or composition. The necessary apparatus is simple: a number of wallbars equal to half that of the class, and ropes and beams equal to one-third or one-half of the class. For vaulting and jumping, enough horses or boxes to work the class in two or three divisions at once; perhaps one horse, one box, one jumping stand. Then, not only can the effect of the sitting position be counteracted, but the teacher can hope to proceed to interesting and successful work in developing power, flexibility, and nervous control in the ordinary way. Each child will be measured at the beginning and end of term, and the records kept. The form I use is simple; can be reproduced on a cyclostyle and so is inexpensive, provides enough room for remarks and sketches of outlines, and is easily filed (cf. p. 39).

In every school there will occur departures from the normal, either coming to school in that state or reaching it during, and often directly owing to, school life. Such cases will need individual attention during regular work—much as a boy or girl who is backward in a mental subject can be helped during class without interfering with the work as a whole—or will have to have special coaching alone or with one more: the coaching in this case may be called Special Treatment or Remedial Gymnastics. I am unable to present figures I helped to obtain from an examination of classes at Eton: they were, however, not essentially different from those I have obtained elsewhere. Experience leads me to expect in any school 30 per cent. of children who need individual treatment (if their physical education is to be worthy of its name), in addition to the three lessons referred to above. The figures are quite ordinary for schools of the well-to-do: they may safely be presumed to be the same for those of poorer children. They are not lessened by a careful attention to games: Plates 5 and 6 are of boys from excellent schools in which games are par-

	191..........................	Name..
Chest:	**Depth**	**Age**
	Width	**Height**
	Girth	**Weight**
Feet:	**Left**	
	Right	
Spine:	**View from Side.**	**From Back.**
General:		

ticularly good. The usual departures from the normal are spinal curvature (lateral or sagittal), the latter generally the more serious of the two in its effects upon flexibility of the chest (Plates 5, 6, 7, 9, 10): the curves are mostly the direct result of classroom life. There are also children beginning school with weak hearts, flat feet, impaired digestion, lack of proper nervous control, etc. Then there are the whole class of school accidents—broken limbs, sprained or torn muscles, dislocations, strained joints of all kinds—which are often with advantage sent by the school doctor for remedial work during the course of his treatment. The whole of this side of the work should, of course, be directly under his control. The form of report I am at present using shows that it is first sent to the school doctor for approval: after receiving his signature it is forwarded to the parents. Some cases are sent directly from home. The gymnastic master or mistress should not give individual treatment without the authority of the parents or the doctor.

Change in muscular balance, the adoption of an abnormal carriage, or the formation of a habit-position, can occur very quickly. Plate 11 shows a case in point, a very marked spinal curve resulting in two months from the distortion deliberately adopted by a boy (after a successful operation for appendicitis) in order to save himself movement, and strain on the abdominal muscles of the side affected. The curve developed during convalescence, and reached the stage shown before it was remarked. It was purely a habit-position, due to fear of pain: on finding his strength improving the boy gradually gave it up, and at the end of one term's special exercises and massage three times

SCHOOL.

Report upon Physique of

Age **Height** **Weight**

Chest :—Depth, expiration
inspiration

Width, expiration
inspiration

Girth, expiration
inspiration

Feet

Spine

General

Length of time for which special treatment will probably be required :—

Signed

Gymnastic Master.

Medical Officer.

Date

a week for half an hour, without class gymnastics, was able to row during the next term. Any of the positions shown on Plates 5-10 might have been adopted equally quickly: they would take longer to correct, probably two terms or more.

The plates are reproduced from "shadow-pictures" or silhouettes taken with an arc lamp. During the three years in which I worked at Eton with (then) Lieutenant B. T. Coote we experimented with various means of recording such cases simply and quickly. We finally used a small arc, giving as nearly as possible a point of light and a symmetrical magnification of the shadow round a centre on the same level as the light. If the distance from the arc to the middle plane of the body be 10 units, and this plane be one unit from the screen of paper, the magnification in every direction will be one-tenth. I have since experimented further with the idea, and find it especially valuable during the actual course of a special treatment, to show a boy his position or carriage. A looking-glass presents too many details and too much diverse interest for most people, and attention is distracted from the essential point—the outline. The silhouette has no such objections: in Plate 11 it is directly visible to the boy, in the others it is visible in a large mirror suitably placed. Plates 8 and 10 are examples of shadow pictures drawn in two minutes or so to illustrate a point in a special lesson: No. 8 arose from an argument as to abdominal contour, and was very carefully checked in the mirror by the boy himself: the dotted lines were drawn last. He took much care to improve during the term. (For normal use the light should be at the level of the lower end of the breast-bone.)

As an example of the weakening effect of prolonged sitting, I would call attention to two or three cases of spinal curvature to the left caused by it in conjunction with special study of the violin. Their similarity was so marked as to make me ask at once, "What instrument do you play?" The development of the curve is probably as follows. The boy spends a definite amount of time each day playing the violin in the position the instrument requires. The position must be held firmly, and linked up in his mind with the music interest is the muscular memory of the attitude. He is also compelled to sit at a desk for some large portion of each day. His spine droops forward, and the previously acquired position provides the tendency to rotation of vertebræ, which is a symptom of most strongly marked curves. In such cases class-gymnastics do not provide sufficiently localized effects to produce correction, and it is quite hard enough to remove the curve with three periods of special treatment a week as well as the class work. It is impossible to remove the cause: a good violinist is too valuable an asset to the community, and his lessons are worth some sacrifice. Specialization in music must be balanced by specialization in exercise, that is all.

The various activities of physical education to which I have referred above do not by any means exhaust the whole field of work. I am led to the conclusion that, valuable as they are, and demanding as they do more special training and ability on the part of the teacher of gymnastics than is at times available, they are made more or less a mechanical department of education. Their value to the school as a whole is shown in increased general vitality, in increased ability to throw off minor ailments, in improved mental work owing to the general improvement of circulation and tone, and in increased self-respect. These at least were the advantages claimed for a daily lesson in gymnastics by the late head master of an excellent Preparatory School near Winchester. They are, of course, enough in themselves to justify physical education in its claim to a fuller share of the time-table. They will react upon mental processes. I am inclined to think, however, that the greatest gain from physical education will be found, not in an increased power of attention—since attention is not a definite power to be acquired in one lesson and transferred to another—but rather in an increased power of inhibition. Throughout all the training there must run the development of the power of isolation as well as co-ordination of muscular action. The necessary muscles must be used in a movement, and the contraction of unnecessary ones avoided. The general result is a power to refrain from action until action is necessary. This means a power to deny effect to external stimuli, which reduces the chances of distraction and enables mental processes to be more easily directed to the matter in hand. In a child well-educated physically, I should expect to find an increased power of inhibition of reaction to external stimuli other than those connected with his work.

CONNECTION OF MENTAL AND PHYSICAL EDUCATION

I frequently find cases, more or less clearly marked, in which the mental and physical work show very similar difficulties and hindrances. For some time I had in Latin as well as in gymnastic lessons a boy of fifteen or so, growing rapidly and increasing in weight. His measurements were: Age, 15 years; height, 5 ft. 11⅜ in.; weight, 11 st. 2 lb. He had none of the weaknesses of the boy shown in Plate 10 (whose age was 15 years 9 months; height, 5 ft. 11¼ in.; weight, 10 st. 9 lb., and whose mental work had a distinct brilliancy and originality). He had great clumsy strength, excessive innervation, and was capable of great effort for a very short time, after which he collapsed more or less completely. All his efforts were exaggerated, and he found peculiar difficulty in any exercises in which one side of the body is moved differently to the other, e.g. he could do a simple leap-frog well, but could not vault sideways over a gate or beam with one hand on it. With his rapid growth he needed the ordinary class-work plus special treatment to prevent him from growing round-shouldered: he needed enough movement to maintain a flexible chest: he needed to prevent his feet from growing flat under his great weight. All these things are within the special province of the gymnastic teacher, and are what I have ventured to classify as a mechanical department of education. In Latin lessons I found him unable to spell correctly, unable to write quickly, and easily despondent at failure to keep up to the level of smaller boys. On inquiry, I found these difficulties occurred in his other lessons. Seen from the side of mental work alone he might have been mistaken for a stupid and backward fool: physically he seemed too clumsy for anything. The consequence might well be that as a result of constant failure he might lose his self-respect and sink to the level of the ordinary hobbledehoy in the middle of the school, too old for a young class, too stupid for an older one. (And here I would point out that the failures of this type in a school are far more probably failures of the staff or of the school organization than individual failures. I firmly believe that the clumsy, rowdy, and uncouth mass which hinders progress in most schools is the result far more of school environment than of any stage of puberty or growth—that it is a mistake to suppose that any such disorganized and unsatisfactory period of mental and physical development is at all necessary.) To return: on further inquiry I found that the boy was very interested in acting, and could learn his parts well. His memory was not at fault. I found him very far from foolish. He was well read, interested in general subjects, and talked well. In a word, he could learn by eye and ear. His power of co-ordination was insufficient. If it were possible to relieve him from the difficulty of writing, he could do infinitely better. As soon as he had to write even a short sentence, the numerous sensations of muscular activity, the chances of error due to phonetic spelling, the certainty of failure to produce any legible result, aroused in him such a whirlpool of discomfort and self-distrust that he lost hope from the first. Had he come to me younger, I could have made things much easier for him. As it was, he gained in nervous control, and the result showed equally in mental and physical work. It was, however, a slow advance until after the second year.

I have written more fully about this case, because I consider it shows more clearly than most the connection between physical and mental education. Improvement in nervous control, in isolation and co-ordination of muscular action, the increase of speed of response to stimulus—it is at these and not at the acquirement of superficial smartness of "drill" that one must aim. It is impossible to separate the two branches of school life and hope for satisfactory results by limiting the training of a gymnastic teacher to a knowledge of anatomy and physiology and the acquirement of the technique of gymnastics. What is needed is a common training in education, branching out later into specialization on one side or the other.

An objection is sometimes raised to Physical Education and—though less frequently—to special treatment on the grounds that it makes children morbid or self-conscious. That it may do so, if foolishly handled, is equally true of religious instruction or the study of poetry or music. Under sensible conditions it does not do so. I have elsewhere (Chapter VII) referred to this. Obviously any subject may be badly taught. There is no harm, and much good self-respect, to be gained from a knowledge that one has a body which is fit and well, in good order, and under one's own perfect control. A flexible chest, a straight spine, good limbs, and happiness in using them in or out of doors, are very valuable things: so are clean teeth and a clear complexion. They may all, however, be thrown together into the scales and will not outweigh the most valuable result of a reasonable physical education, the possession of a clean body under the control of a clean mind.

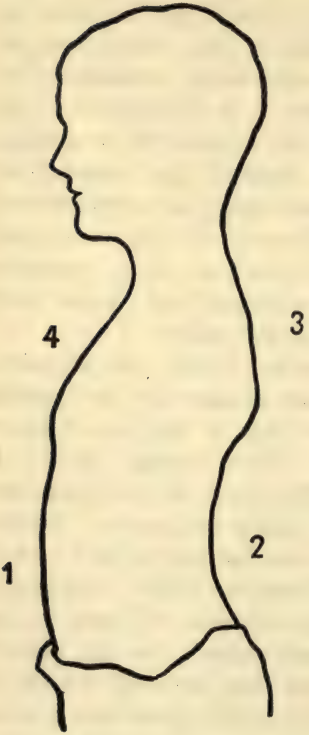


Plate 1

Description.

COMFORTABLE STANDING POSITION.

Remarks.

Habitual comfortable standing position of an ordinary type showing no marked changes of contour.

Age, 13 years 2 months.

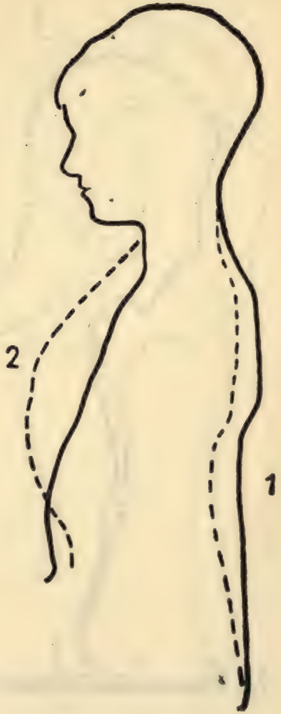
1, 2, 3, 4 show parts liable to change as result of prolonged sitting.

Plate 2

Description.

SITTING POSITION.

1. Comfortably upright.
2. Fullest inspiration.



Remarks.

Full line = good comfortable sitting position.
Dotted line = fullest inspiration.

Age, 15 years 0 months. *Height,* 5 ft. ½ in. *Weight,* 6 st. 1 lb.

Figure 1 shows relaxation of abdominal muscles. Figure 2 gives an idea of the flexibility of chest which prolonged sitting diminishes.

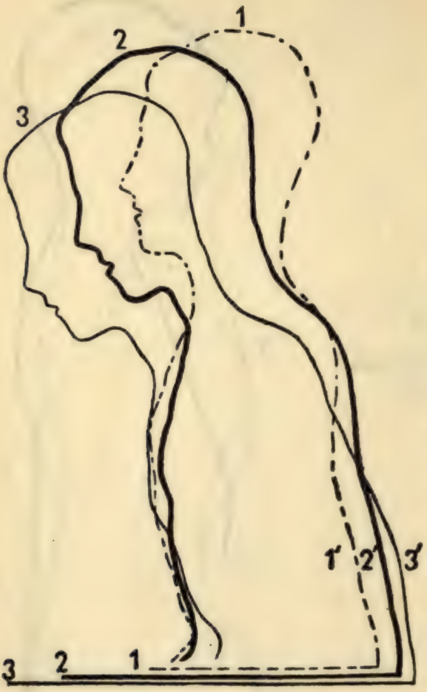


Plate 3

Description.

SITTING POSITION.

1. Best possible.
2. Comfortably upright.
3. After five minutes.

Note.—The boy attempted to hold position 2, whilst reading a book, and was unconscious of any change of position at the end of the time.

Remarks.

1′, 2′, and 3′ show how the pelvis and lumbar spine roll backward as the head comes forward.

The three lines below the figures show the increase in the overhang of the body as the position changes, and suggest the amount of extra work entailed upon the spinal muscles.

Abdominal relaxation not evident, owing to trousers being fastened, and thus constricting the waist.

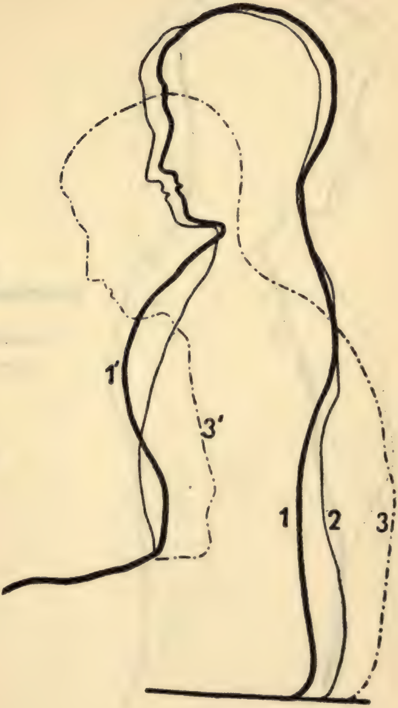
Plate 4

Description.

Sitting Position.

1. Upright. Maximum inspiration.
2. Comfortably upright.
3. Stooping badly.

Note.—Thighs and feet remained unmoved.



Remarks.

Rolling backward of hips very plain.

The plate shows the extreme of change in contour between 1 and 3, and is intended to demonstrate the amount of movement possible in the upper part of the chest, and the interference with this caused by a very bad sitting position, cf. 1' and 3'.

Age, 13 years 10 months. *Height*, 5 ft. 5½ in. *Weight*, 7 st. 10½ lb.

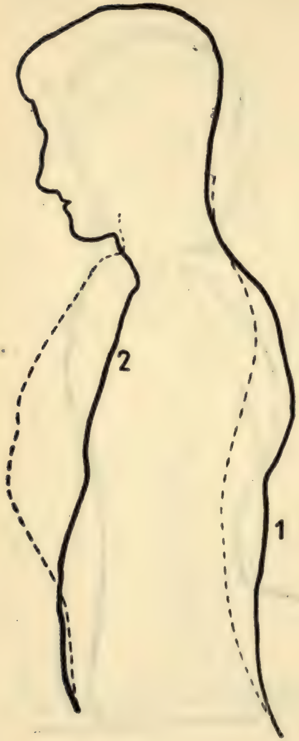


Plate 5

Description.

NORMAL STANDING POSITION, AND DEEPEST INSPIRATION.

Remarks.

Age, 15 years 4 months. *Height*, 5 ft. 9¼ in. *Weight*, 9 st. 12 lb.

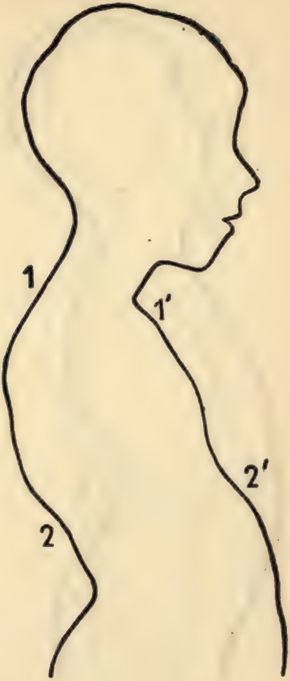
Extremely flexible and of more than average muscular power. In first eleven at cricket and football. Mentally of much promise. The low "round back" at 1 is the result of desk-position, and renders the position of the breast-bone at 2 very difficult to correct even with special as well as class exercises. The consequences of such a position may be expected to show very clearly in later life. Cf. Chapter III, p. 24.

Plate 6

Description.

STANDING POSITION.

Normal comfortable.



Remarks.

Skeletal relations from points 1, 1′, to 2, 2′, are those of the sitting position, unchanged.

The erect position is obtained by a remarkable hinging backward of the spine below 2. The alteration of the intervertebral discs will be proportionate.

Immediately above 2′ was a marked depression on the left side at the level where the ribs touched the desk as soon as the droop of the figure became sufficiently marked.

Note the unusual abdominal contour.

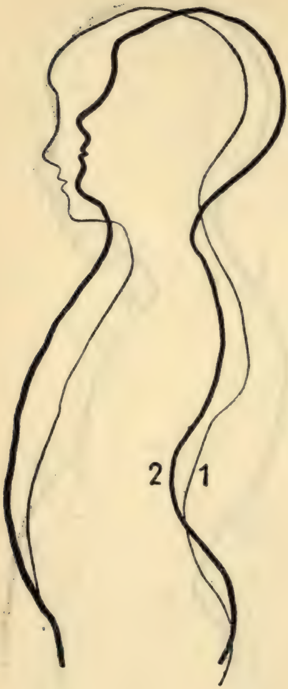


Plate 7

Description.

NORMAL STANDING POSITION AND (MISUNDERSTOOD) BEST POSITION OF ATTENTION.

Remarks.

Age, 13 years 4 months. *Height*, 4 ft. 11½ in. *Weight*, 5 st. 9 lb.

Nervous and very excitable. Very keen on gymnastics. Line 1 denotes the normal standing position, and shows the hollow back produced by desk-position. Line 2 shows how the hollow back is exaggerated by the desire to "make a large chest": the round back is not corrected, and as soon as the position is relaxed all the faults of 1 will appear in an increased degree. In a shirt or tunic such lines may easily escape the eye of an incompletely trained teacher in charge of a class of 30 or more.

Plate 8

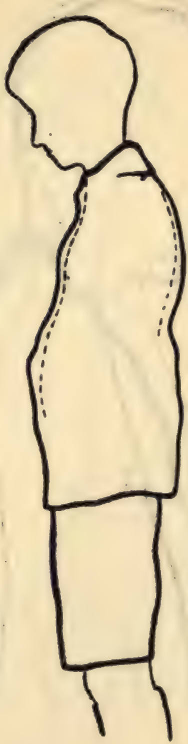
Description.

STANDING POSITION.

Normal comfortable.

Dotted lines are actual profile of body. Full lines, outline of sweater and football trousers.

A student type.



Remarks.

Age, 16 years 9 months. *Height*, 5 ft. 4½ in. *Weight*, 7 st. 7½ lb. Mental ability remarkable: high up in school. A good average example of general posture. Slight spinal lateral curve to left side—not rigid.

Note flexion of knees.

Even these clothes somewhat hide contour of figure.

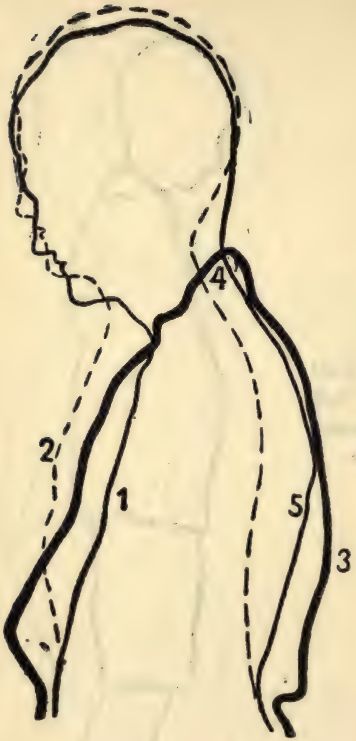


Plate 9

Description.

Standing Position.

1. Normal comfortable.
2. Best: middle position between inspiration and expiration.
3. Outline of games shirt.

Remarks.

A good example of the extent to which clothes hide outlines.

Age, 14 years 0 months. *Height*, 5 ft. 6¼ in. *Weight*, 8 st. 3 lb.

Shoulders very round: left higher than right. Short lateral spinal curve to left from 4 to 5. Left-handed writer: in some respects right-handed. Movement in upper part of chest very small. His normal breathing is almost entirely abdominal.

Clever; original: hard working. A student type.

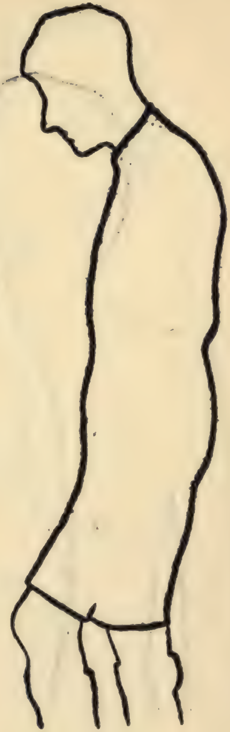


Plate 10

Description.

STANDING POSITION.

Comfortable habitual attitude.

Clothes, jersey and football trousers.

Remarks.

Age, 15 years 9 months. *Height*, 5 ft. 11¾ in. *Weight*, 10 st. 9 lb.

Clever. A student type. Short-sighted, nervous. Co-ordination not good. Feet, flat. Generally rather weak. Absolutely necessary for him to be helped to grow up straight and strong. Will in all probability live a sedentary life, and, if he knows how to keep fit and maintain a good position, have a longer and presumably more useful existence.

Improvement from special treatment very marked.

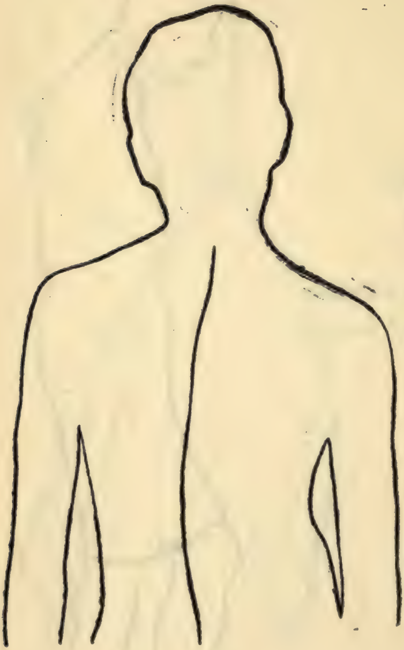


Plate 11

Description.

STANDING POSITION.

Habitual, adopted in less than two months after an operation for appendicitis.

Note.—Seen from behind.

Remarks.

Special treatment for this case began with massage and the lightest type of abdominal exercises, increasing in about a fortnight to stronger movements. In less than six weeks he was able to swing on a rope over a jump, raising knees, grasping rope with hands only (right hand highest). Treatment ended at end of one term, and he was very much improved by it,

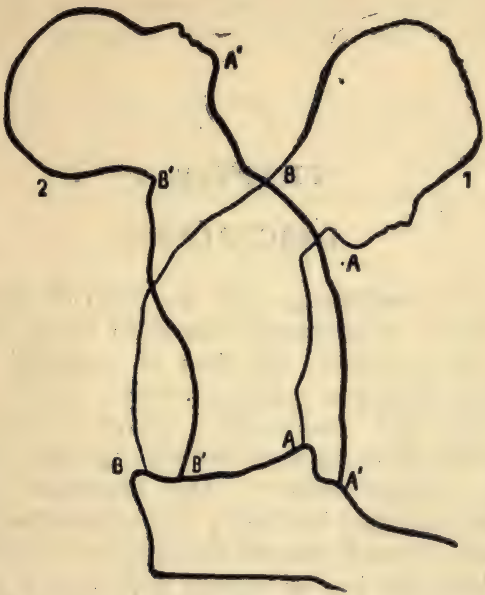


Plate 12

Description

SITTING POSITION.

1. Comfortable reading position.

2. Corrective exercise: "Sitting, trunk bending backward, with head bending backward and deep breathing."

Remarks.

Note change in length of line from A A to A′ A′, and B B to B′ B′.

This exercise is learnt sitting on a bench, with beam at suitable height behind back. It is not lolling backward, but a strong over-extension of the upper dorsal spine, with full inflation of chest. It is a correction of position 1, and each boy learns to do it when he feels he is stooping. Members of a staff might learn to understand and use it occasionally instead of repeated exhortations to "sit up."

CHAPTER V

DISCIPLINE

ONE of the advantages of any form of gymnastics or "drill" is commonly stated to be an improvement in discipline. A class is supposed to gain discipline during a gymnastic lesson, and as a proof it is said that classes which in other subjects are notoriously ill-disciplined are often the direct opposite whilst "doing drill." The statement implies: 1. That discipline is either a part of physical exercise or can be directly taught through it; 2. That such discipline can be, or should be, carried away by the children and employed by them in another classroom during a different lesson. This is not the case.

Discipline is a term which is often wrongly, in general carelessly, employed. By "a good disciplinarian" is usually meant a teacher whose classes are quiet; "a bad disciplinarian," one whose classes cause trouble either to their own teacher or to the rest of the staff or the school. The wrong use of the word discipline, and the false association with it of conditions which depend on many other circumstances, is at first less obvious in connection with gymnastic than with other lessons. Whatever discipline may be, it will be the same in essence whether the lesson be physical or mental: conditions favourable to it will be the same in the gymnasium, the laboratory, or the classroom. It will not necessarily be capable of being learnt in one and transferred to another.

Discipline is not a thing which can be given by a teacher to a class. It is, and will always remain, something which any class can withhold from any teacher, whatever the subject being taught. Severity, heavy punishment, the tone of the school, and other external circumstances may disguise for a time its essential quality: ultimately, however, it will be found to lie in the class itself.

Upon entering a classroom children pay in—as it were, into a common fund—a certain amount of their self-control to the teacher. For the purpose of common action during class, to enable the class as a whole to study the subject in hand, they realize that it is necessary for individuals to subordinate their wills to a greater or less extent to the common good. This sacrifice is made readily to one whom they feel or know to be capable of making good use of it: it is made readily to one teaching a subject which is in itself—or is made—interesting: it is made less readily to one whose lessons are known to be dull: it is made unwillingly or not at all to a weak teacher who relies upon punishment to enforce it. But whatever the subject, be the teacher interesting or severe, discipline is given *by* the taught, not *to* them. It is a temporary yielding of individuality for the common good. In its essence, it is self-control.

A good disciplinarian then is—or rather should be—one who swiftly and most completely obtains this from a class. Interest in the subject, either natural to the class or derived from the skilled handling of it by the teacher, is an enormous help. Punishment may for a time produce apparently the same result, but as soon as the fear of punishment is removed—either out of school hours or after school age—the false control it has obtained dies away, and the child or youth becomes indisciplined, lacking that self-control which alone is permanent. Willing co-operation with the teacher and the rest of the class develops self-control ; a forced or harsh control by the teacher hinders its development. Even military discipline tends more and more to co-operation, as individual initiative becomes more necessary. The days are past when human beings can be forced either to fight, or work together, in chains. The more rigid the discipline—even in an army—the greater the relapse once it is removed. In a school, in a class, it must be flexible, adapting itself wherever possible to individual needs.

One of the causes of the misconception of discipline in physical work in the past has been the readiness with which children submit to it there. This is in part due to the real relief which movement of any kind provides from the tedium of the ordinary class. It is very natural, since in classrooms the first condition of work is the restriction of movement, whereas in any form of physical education (however dull) movement is an essential. I have analysed above the muscular results of restricted movement : the nervous and mental consequences are as strongly marked. Restricted movement not only produces lowered muscular vitality, it causes a mental—even a spiritual—depression. In consequence a class comes to a gymnastic lesson predisposed to obey commands as the simplest means of obtaining the movement and exercise it desires. The teacher of gymnastics is thus able to rely upon a predisposition to obedience. Now obedience is not and never has been a rule of the game in ordinary class work, in England at any rate. It is a first principle of teaching that the teacher is fair game, if the class can make him so, as the wrecks of many promising scholastic careers can witness. In the old-fashioned "drill" conditions were reversed: unquestioning obedience was a rule of the game. This, however, is not to say that control could be learned in the one and transferred to the other: what happened was that the class came prepared to submit themselves willingly to control, for the purpose of common action. The control, the discipline, was of themselves: the external conditions caused it to appear different.

Now a gymnastic lesson is no "drill": as soon as it becomes so in the hands of an unskilled teacher it loses its claim to be considered a part of physical education. A stern appearance, a rigid carriage, a fierce and quasi-military word of command, may succeed for a while in producing a "smart" and apparently ready response. But unless the necessary knowledge of the human body and of the needs of human growth underlie the whole lesson, it will become artificial, the movements will be conventional, and natural development will suffer. To an untrained observer the result may appear excellent: there will be a surface precision of movement, the class may indeed work together with the accuracy of an adult competition-team. This, however, is not the aim of physical or mental education. Compare the mental work of a class in—say—history, with its gymnastic lesson. Certain parts of the work are standardized: the desk-position is the same, the class are reading or writing together, or answering questions orally, the single mind of the teacher is calling up with varied inflexions of voice as many and as varied individual activities as there are children in the class, and the sum of these activities makes the lesson. The same class, and in some cases the same teacher, go into another room for "drill," and an entirely different process is evident: the teacher's voice becomes harsh and imperative, the children's movements jerky as those of marionettes. Yet the same brains are seeking to express themselves: the children have not changed. What has happened is that an external convention of movement is being forced upon them: the teacher is employing a conventional command, and too often the inflexions of his voice have entirely lost their delicate play.

Much remains to be changed before the gymnastic lesson can be called educational: so long as the conventional tone of voice at present in use continues to be employed, so long will the nervous response to a command be exaggerated or incorrect. The tone is a survival of that used in drilling large bodies of adults in the open, in a drill, too, which was more rigid than that in use to-day. It is not, and never has been, based upon the need for a suitable nervous response nicely calculated to produce a definite effect upon the growing body of a child. The direct, almost telegraphic, simplicity of the command is necessary so as to save time and eliminate misunderstanding. The speed and inflexion of the executive word is conditioned by the nervous response required: it is a very delicate combination of a knowledge of nervous and muscular action, and an intimate acquaintance with the special needs and difficulties of the individuals in the class. If it varies by even a small fraction of time or audibility, the movement depending on it will suffer : if it be exaggerated, the movement will at first be too coarse, and later the responses will become less accurate. In any case the tone and speed must be widely different for a class of children and a squad of adults.

Absolute similarity of movement, absolute accuracy of form, superficial smartness of a class have nothing whatever to do with discipline. The first may indeed interfere with individual growth ; the second may be obtained at too heavy a cost from a young class ; the third may be worthless, or, worse, may even conceal the faults of an otherwise unsatisfactory lesson. The old ideas of drill and discipline were based upon a misunderstanding : an external result was confused with an internal response to stimulus. Self-control of the body, the one thing at which physical education should aim, is not to be acquired by such means. A lesson in gymnastics, as much as one in physics or chemistry, depends for its success upon the observance of educational laws, upon interest, upon a willing co-operation of teacher and taught. It cannot but suffer by the continued insistence upon methods of teaching, which are rapidly ceasing to be employed even for the ends which they were once thought suitable to obtain.

CHAPTER VI

THE RELATIVE STRENGTH OF GIRLS AND BOYS

LITTLE attention has been given to the influence of ideals of beauty upon bodily development, though we are all familiar with ephemeral changes in the waist-line owing to the decrees of fashion. This may be regarded as an instance of the application of a general law, to be compared with the binding of feet in China or of heads among some native American tribes, the insertion of wooden discs in the lobes of the ears, or the widespread practice of tattooing. Such aids to beauty depend for their effect upon the deliberate damage of the human form. Milder examples are to be found in the black spot upon the cheek, or the powder in the hair of a Georgian belle. A complete study of the influence of fashion or convention upon bodily activity will include the introduction of the side saddle, invented to allow gorgeously robed ladies to ride in processions without interfering with their display of dress, an idea which had not occurred to the Wife of Bath. Some even go so far as to say that the paintings of Rossetti and Burne-Jones produced an apparent change in the length of neck of those who admired the type which they portrayed. Whether or not this be true, there can be no real doubt that the general development of men and women is enormously affected by existing ideals of physique. If we consider the statuary to be found in the museums of Europe, we find that the general public is content to accept the decision of Baedeker, whose excellent system of stars renders individual appreciation unnecessary. The Apollo Belvedere is the standard for manly perfection, whilst the Louvre provides countless thousands per annum with the sight of what they have been led to believe the most perfect type of woman, the so-called Venus of Melos. Of late years a tendency to break away from this tradition has shown itself. In idealizing the workers of Belgium, Meunier gives his man the form of a dock labourer or an ironworker : his woman varies between Hiercheuse and Fécondité. Larson, however, in immortalizing his model before the looking-glass, paints her round-backed, hollow-backed, and more drooping than any willow. Zorn sways at times to the opposite extreme of heavy, broad-hipped, stumpy peasant women. If it be true that we imitate what we admire, there is a fearful future before the Post Impressionists.

From among the available mass of artistic idealism there stands out clearly one type for men and one for women. The man is to be muscular to the point of lumpiness, the woman graceful and rounded even to weakness. Distinction, reputation, and a fair modicum of this world's goods may be obtained by those who set out definitely to realize such ideals. Not to speak of some well-to-do "Physical Culturists" in England, who guarantee men a large biceps and women a small waist, we have the statement of the Union of Gymnastic

Societies in France that "boys must be trained for strength and boldness, girls for grace and suppleness." The two specialists in this business, who occupied most of the time of the 1913 Congress of Physical Education in Paris, and obtained a tremendous popular success were, according to their own showing, aiming at this differential treatment of the sexes. Carried to a logical conclusion, the theory gives a beautifully simplified anatomy for gymnastic teachers, for a high authority in Medicokinesio-therapy stated at the Congress that the most valuable movement for girls was deep knee-bending, since this most exercised the ilio-psoas muscle, in the immediate neighbourhood of which were situated their most important internal organs. If time allowed, it would be interesting to study the muscles actively in use during this exercise. Though in England we have not yet specialized so far as this, we know even now on the authority of the *State Handbook of Physical Training in Schools* that certain sets of exercises are more suitable for girls than boys, and vice versa. There is indeed reason to believe that already some doubt exists in high quarters as to the advisability of allowing girls to perform movements in which the weight of the body is supported by the arms. Put quite shortly, the general theory is that of France, strength for boys, grace for girls. In practice this works out at dancing for girls and drill for boys. Blurred reminiscences of Apollo, Hercules, Michelangelo's David, and Hackenschmidt, a composite mental photograph of the Venus of Milo or Medici, the beauties of Rubens or Bouguereau, have given us such ideals as may be found in the "Baiser" of

Rodin, or Greiffenhagen's "Idyll." This means that we have started with a clear conception of the objects we wish to obtain and have worked from without inward, after the fashion of the Dutch gardener, who with knife and shears persuades trees to take upon themselves the semblance of some strange bird.

Physical Education is, or should be, a science. In scientific research one is accustomed to look for accuracy of observation and logical deduction. Existing data are collected and examined : natural laws of various kinds are borne in mind, and—should some unexpected by-product appear during the experiment—the processes of examination and reasoning are tested. Should no mistake have occurred, we admit that another step has been taken along the road of knowledge. It would be unscientific, to say the least, if the experimental chemist or specialist in dyes were to allow his artistic prejudices to hinder his research, to say to his employer, "I will discover a red or blue or green, but do not ask me to find you a 'fast black,' for black is a colour I cannot abide." It would be deliberately inaccurate for an expert in metallurgy to insist that, since heat softened and eventually liquefied metals, it was for ever impossible to invent a drill which would continue to cut when heated through being run at a high speed. Though the contemporaries of Galileo are long dead, they have left behind them a numerous progeny, and some of these have become authorities on Physical Education. It is vain to ask them to pursue the inquiry scientifically, to begin with the human body as it comes into the world, to study its capabilities, to examine the conditions under which it lives, to experiment, to make mistakes, and finally to develop it to the full extent of its powers. Even if they so desired, the corsets of their æsthetic conventions would hamper their freedom of thought. For them the sun will still continue to go round the earth.

An analysis of accepted conventions of physical beauty shows them to be even more insecure in their foundations than they at first appear. The modern ideal traces its descent directly from ancient Greece. Were we a Southern or an Eastern race there would be small cause to doubt the suitability of such a model for English men and women. Men, indeed, have less reason to quarrel with its influence, since Greek statues of even a comparatively late period provide instances of gracious supple forms. Women, however, have suffered more from it, owing to a geographical fact which seems in this connection to have escaped notice. Both politically and artistically the Greeks fell under oriental influence, because Greece was so near to Asia. In Greek art and literature we find two types of the perfect woman, the mother and the courtesan. To-day in lecture theatre and class-room there is a studious concentration upon the Spartan mother, and Phryne is referred to only in the appendix to the text-books. If mention must be made of Aspasia, it is done discreetly, with special stress upon her mental attainments. What is never made clear is that the position of woman in ancient Greece was not always far removed from subjection, that it was largely influenced by Eastern thought, and that in Greece, as elsewhere, social conditions reacted directly upon types of beauty. Rome has not contributed much toward our ideals of physical perfection, but so far as it was possible for a military state to do so, she grafted her conventions upon the beauty of the statues she stole, and handed them on to us. Our innate respectability as a nation led us to over-rate still further the Spartan mother, until to-day we find ourselves attributing her splendid qualities to a statue in the Louvre, which may or may not have been intended to represent Venus. The woman of the North, on the other hand, was for generations a free being, taking her share in local and national affairs. Hence it is the more surprising that we, as a Northern race, have for so long been content to accept Eastern and Southern standards, colour them with Jewish sentiment, and follow them without question. The attempt to fit the Northern women with the fashions of the Orient has impaired her activity. Neither the Venus of Milo nor her Medicean sister would find it easy to run to catch a train, nor are they in condition to play tennis or lacrosse.

To sum up, the generally accepted ideals of beauty, coupled with a conventional attitude towards bodily activity, constitute a home and social atmosphere which surrounds and affects the growth of children from a very early age. Boys are supposed to be rough and strenuous ; girls are expected to be quiet and graceful. Boys may even use violence to each other with every prospect of approval in or out of school. In some schools girls are compelled to walk with their hands behind their backs, and are encouraged to develop a special deportment. Whatever their standard of mental work may be, boys' schools make a definite attempt to turn out healthy young animals, whereas many head mistresses are more concerned to educate healthy young ladies. This implies a fundamental difference of conception of the need for movement for boys and girls ; a different idea, that is, of the value to them of one of the prime necessities of growth. In support of this theory of difference between the two we have a careful classification of all the movements which boys can and girls are said not to be able to make. One of the most frequently cited is the act of throwing a ball : some authorities explain that girls cannot do this because their collar-bone is longer, and prevents their shoulder from coming forward far enough to make the throw properly. Other experts in sex differences state that the collar-bone of a woman is almost invariably shorter than that of a man, and that this is one of the tests for determining the sex of a skeleton. Those whose work it is to analyse movements will understand that this particular action demands great power of co-ordination, and if not learnt by long practice needs special teaching, and, when properly taught, is easily acquired. Their knowledge of the human body will enable them to say that, so far as class-room life and prolonged sitting are concerned, the muscular and skeletal results are the same in both girls and boys, since restriction of movement produces the same effect upon growth without regard to sex. But both in and out of school the two handicaps of immobility and convention weigh more heavily upon the girl. There is, in addition, another influence which affects her alone, the limitation of dress. If, by its inability to allow of movement, a school desk causes a loss of vitality during certain hours of the day, what is to be said of restrictions of activity which are carried about on the body from early morning till late at night? It will be said, of course, that the modern skirt permits freedom of movement, and that corsets or waistbands give support: it will be pointed out that in many girls' schools a gymnastic costume is worn, and thus freedom of movement is assured. But the question of freedom of movement allowed by a costume cannot be answered by girls or women who have been accustomed to limited freedom from infancy, and therefore mistake comparative for complete liberty. In order to find out how far such garments interfere with motion they must be worn as an experiment by boys or men who have always had unrestricted liberty for legs and waists. The answer will not be delayed, since every boy knows that even long trousers are uncomfortable and unsuitable for running and jumping, owing to their fullness over the ankle and a dragging at the knee which prevents complete flexion. To them at least the question is manifestly absurd. Most of their games are opportunities for free bodily action, while many games for girls are intended more as exercises in graceful movement than as competitive effort, and are often such as may be played in a skirt. Also all games for girls are milder than those of boys.

The weight of a skirt may or may not be large, but the amount of wind resistance it causes cannot be left out of consideration. Whether hung from the waist or the shoulder it must shorten the stride of the wearer. This again entails extra work in walking and running, activities which are also interfered with by corsets. An analysis of the movement of walking shows very clearly the kind of hindrance occasioned by the combined action of these two garments. Suppose the left foot is forward, with the weight of the body just coming on to it: the right leg is at this moment stretched backward. It is then bent, and swings forward, and is extended to take up a new position in front of the left. During this swing the leg is not carried straight forward, but—along with the hip-bones—revolves about the top of the left thigh. This necessitates the displacement of a large portion of the body's weight, forward on the right side: to counteract the sway thus set up, the left arm and shoulder and upper portion of the chest tend to swing forward on the left side. The whole action is a delicate combination of muscular effort designed to enable the head to move forward in as straight a line as possible, and with the minimum of rise and fall. In the case of boys this is quite easy, but girls not only have the backward and forward stretch of the leg reduced by their skirt, but are also prevented from obtaining the full compensatory movement of arm and shoulder. Many of them are also taught to walk without swinging the arms. The sum of these results may be seen by watching a class of girls or women marching round a gymnasium: there is no resemblance to the progression of a group of boys. This is not due to innate sex difference but to wearing conventional garb and having conventional ideas of movements. Even the freest skirt interferes with flexion of the knee and hip: this is seen clearly when going upstairs, and still more so in climbing a ladder.

These are unnecessary handicaps, affecting school life of course, but even more so life out of school. Unfortunately the gymnastic lesson itself is not free from similar influences. Existing conventional ideas of Physical Education, coupled with the teacher's own convictions, too often prevent the lesson from providing equal opportunities of development for both sexes. Since girls must be graceful and must therefore learn to dance, the floor of the room in which the lesson is given is often polished (more or less) for the dancing lesson. This means that no gymnastic exercise depending for its effect upon accuracy of foot-placing can be correctly performed. Now the floor is the most important piece of apparatus in the gymnasium, for the simple reason that the class are most frequently upon it: a parallel to the folly of polishing it would be to have splinters in the beam upon which the hands have to support the body. Other hindrances to free development are found in such general opinions as that girls cannot jump as well as boys. (The word "jump" may be replaced by almost any verb expressing physical activity.)

Let us take the sub-divisions of the gymnastic lesson in turn, and compare the amount of work and the standard of achievement expected in them from girls and boys. The opening exercises may be considered as being of the same strength for both. In the next group of movements (trunk bending backward, for correcting a round back and developing the chest) the effect of dress is instantly evident. The fall of a tunic from shoulder to waist or hip effectively conceals all but the most marked mistakes in the exercise. This handicaps the teacher unfairly, and since it is improbable that all teachers of girls' classes are above the average in keenness of eye and knowledge of skeletal position, it is reasonable to suppose that many of the mistakes remain uncorrected. With boys, even a shirt or a sweater produces the same result (cf. Chapter IV, Plates 7 and 9): they can, however, wear a vest, in which case faults are easy to correct. Next in order come heaving exercises on beam, ropes etc., in which the weight of the body is supported partly or wholly on the arms. This group of movements is absolutely barred to girls and boys alike in schools where no apparatus is available, i.e. in practically all the elementary schools of the country. Where apparatus exists, the general idea that girls are weaker than boys asserts itself. Yet those who are used to taking classes of boys know that their average of strength in these movements is quite low. Some can "muscle up" to a bar or beam eight or ten times, but only with undergrip. Overgrip, in which the action of the biceps is limited, is very hard for most of them, even before the age of puberty, and large numbers of clumsy fellows during this period of change find it beyond their power to do the exercise more than three times in good form. Another consideration has to be taken into account, the accepted idea of beauty for a girl. She may sometimes appear in evening dress: is she to present the arms of a worker to the gaze of the assembled company? Marriage is still one of the trades of the world, and hence possession of an accepted type of beauty is a financial asset and must be reckoned as such.

Balance exercises, with their delicate muscular adjustment and nervous control, are a form of movement closely allied to dancing: here the standard of strength and performance is, perhaps, equal for boys and girls. It may be that some girls do them better than some boys: the question is an open one.

Dorsal or "shoulder-blade" exercises which flatten the back in the region of the shoulder-blades are equally valuable to both sexes. Girls especially devote much attention to them, since to a girl a flat back is as much an asset as rounded arms. Now the typical dorsal exercise, in which the body falls forward from the hip-joints with a straight spine, entails a good deal of work for the muscles of the lumbar region. These are, with others, engaged in antagonistic work with the muscles of the abdominal walls in straightening the lower part of the spine and preventing "hollow back." But the abdominal muscles are weakened, lengthened, and lose tone in consequence of prolonged sitting. This affects girls and boys alike. Girls, however, owing to handicaps of dress and of accepted conventions of movement, not only have further abdominal weakness to contend with, but—as we shall see—actually receive less correction in this respect than boys in the gymnastic lesson. Excessive attention to dorsal exercises in their case, therefore, tends still further to destroy the balance of lumbar and abdominal muscles (through the extra lumbar work which many dorsal exercises necessitate), and develops or increases a hollow back.

Abdominal exercises are always taken more strongly with a class of boys than with girls. Indeed, the mere suggestion that girls should be treated on an equality with boys in this group of movements invariably arouses a storm of indignation. In the *State Handbook* abdominal exercises are collected in an appendix—a species of parergon. Side-bending and side-turning are, of course, included in the tables of exercises. They are "grace-developing," and as such are suitable for girls. The *Handbook* also states that those abdominal exercises which are done on the floor are not to be used when the floor is not clean enough (which is obviously often the case), or by girls unless their costume is suitable. This would at first seem an admission of the contention that girls' costume hinders their activity: unfortunately it is equally probable that it is only a concession to propriety. It might, perhaps, seem logical to give girls more abdominal exercises than boys: this, however, is opposed to accepted ideas and conventions. Reference to the detailed analysis of the sitting position and its effects will show that it alters the angle between the pelvis and thigh, and tilts the whole pelvic cup forward and downward. The relative position of the pelvic contents is thus altered.

Perhaps this might be considered sufficient reason for lessening the handicap of dress and correcting such faults as far as possible. Here, however, we are confronted by the statement that girls must have special flexibility in this region of the body by reason of their special needs and functions: it would not be good for them to have these muscles developed. Underlying this is the old misunderstanding of development. The phrase "muscular development" calls up the picture of the boxer, the wrestler, and other hard and lumpy persons, and lack of clear thought transfers this idea (by false association) to development of muscles generally. It cannot be too strongly insisted upon that the ideal of muscular development is not hardness: the best muscle must be capable of contraction when in use, of relaxation when its work is not needed. This is admittedly the ideal of modern scientific physical education for boys and men: it is equally the ideal for women. Here there is no sex difference. Now, if the function of parentage is to be performed, it is reasonable to assume that abdominal muscular tone is of value during the prenatal period, when internal pressure is gradually becoming greater, and at the moment of birth, when abdominal muscular action is specially necessary. Is it reasonable to suppose that such functions, demanding a very perfect muscular tone, are best prepared for by prolonged sitting in school during a large portion of the period of growth, and by continual restrictions of activity during youth and adolescence? Is it not just possible that the present conditions of growth and education for girls are responsible for a number of the alterations in relative position of the abdominal and pelvic contents, for a great amount of weakness and impaired digestion, and for some of the difficulty in restoring the tone of the abdominal walls after the birth of a child, if not indeed for many of the dangers of motherhood?

The relative perfection of marching as shown by boys and girls has already been considered, and its causes discussed. As a means of transporting the human machine from place to place with the least exertion, marching as taught to girls is—if not actually wasteful of energy—at least negligible as regards either beauty or efficiency. This is to be traced directly to handicaps of dress, amongst which high heels must be reckoned. In jumping exercises, including all forms of vaulting, what has been said about polished floors still holds good. No jump can be well or safely done if the take-off is inaccurate or the landing insecure. The idea that girls always jump less well than boys exists even in training colleges for women teachers of gymnastics. In one case I have known, the horse was never raised more than six inches from its lowest position from the time it was placed in the gymnasium. It is beyond doubt that a lower standard for girls in this class of movement is accepted by both men and women teachers. Now an analysis of the movement of jumping shows that the abdominal muscles come largely into play. When the legs are bent in relation to the body, the hips must be steadied by these muscles so as to give a firm origin to the movement: if the spine has to be curved and the hips themselves raised, these muscles are still further employed. Any restriction of jumping thus means a restriction of abdominal exercises, and vice versa. As to the relative capability of girls and boys, it is obvious that at present boys jump better than girls, and this is not to be wondered at, considering the inequality of opportunity provided for them. Some say it is because the girl has a lower centre of gravity: it is equally possible that it is owing to the fact that her hair is longer. Jumping is a matter of strength, co-ordination and timing of movement, strength to raise the weight from the ground, timing to obtain other effects whilst the weight is off the ground. It is possible to test quite simply the strength available for a spring, that is—the strength of the extensors of the legs. Stand between two vertical ropes, jump upward as high as possible and, with straight arms, seize the ropes as far up as you can. Then hang down loosely and as far as possible, with toes pointed downward: the distance of the toes from the ground will give a rough practical measure of the strength of your spring. Two inches will mean a good strength, five inches a strength above the average for girls or boys. Their relative strength in this shows little or no difference. One of the largest springs I have ever seen, nine inches, was done by a woman gymnastic teacher, who yet was incapable—through lack of knowledge of timing and co-ordination—of many jumps which would have been easy for the average trained man. Less than a week, however, enabled her to learn how to perform exercises for which she had more than average ability, though her previous training had led her to believe them beyond her power. The factors which make it possible to do leap-frog—or other such exercises—over the horse or box are known and taught to students as follows : the run-up, the take-off, the movements whilst in the air, and the landing. In a word this is co-ordination. Now co-ordination of muscular effort is not a matter of strength ; it is not a sex quality. If it were, it might be argued that it was a female quality quite as much as a male, since balance exercises and dancing make special demands upon it ; and we have seen that the former are done equally well by girls and boys, while the latter is almost a special province of girls' gymnastics. As far as the tunic is concerned, it prevents any accuracy in performing or judging high jumps, it makes some stride jumps impossible, and renders many more exceedingly dangerous.

We need not consider the closing exercises. Enough has been said to show that accepted theory and convention not only restrict the activity of girls and force upon them a low standard of capability and execution in life out of school, but even—in the gymnasium itself, which should be the focus of physical activity—accustom them daily to an inferior level of achievement in most of the subdivisions of the gymnastic lesson. The result upon national life cannot easily be estimated: probably this passive acquiescence in an accepted theory—which is as simple to analyse as it is difficult to maintain with any semblance of logic—lies at the root of many other manifest inequalities of treatment. This is no plea for replacing the present standard of girls' gymnastics by that which is expected of boys. Even the latter is not based on fact, or upon average capability: it is a slovenly generalization from the standard of the first or second eleven at cricket or football, the eight in rowing or gymnastics: it leaves out of consideration such boys as are afraid of a balance exercise upon a beam three feet above the ground, who dare not for a long time climb a ladder, who need and do not get remedial treatment, who overtrain and overstrain themselves for school sports. All that is asked is an honest inquiry and experiment in potentiality, an equality of opportunity, a scientifically-minded investigation of the mechanism of movement, a reconsideration of the whole question of the relative strength of girls and boys.

Parenthood is, after all, a twofold function: at present we are somewhat illogical in our attitude towards it. While interfering directly with the development of the girl, we in many cases overdevelop the boy. When they grow up the theory still is that one will devote herself to the housework and family life, while the other goes out to earn his living. Even if it were true we do not really try to fit the girl's physique to meet the strains of existence. The facts, as we well know, are quite different. In practice, a large portion of the world's work is done by children, by adolescents: both boy and girl go to school during the day, and work at home or in the street before and after lessons. The father and mother are in many cases both of them wage-earners. And since from early youth the two are brought up to believe in the lower standard of strength for the girl, it is not to be wondered at that when they are grown up the doctrine of equal pay for equal work finds so few supporters. The teachings of childhood are not so lightly thrown aside. When the woman enters the labour market, as economic necessity forces her to do, she is compelled to accept lower rates of wages than the man in almost every occupation she may take up. All men and most women believe what they have been taught as children, that the girl is weaker than the boy, the woman than the man. She is hemmed round with legislative restrictions on the ground of sex disabilities and special needs which—far from having attempted to remove—we have deliberately exaggerated. The woman must work certain hours, and only in certain places; the man is permitted to work under conditions which lower his vitality and impair his usefulness as a citizen and a parent. (This is no argument in favour of restrictive legislation or factory acts: the worker must be enabled to make his or her own terms with the employer.) Our respect as a nation for physique and human life is curiously incomplete. We accept a low standard for men and a lower one for women, we disregard obvious influences which reduce them still further, and then—solemnly counting heads and measuring heights and chests—our statisticians arrive at an average of development which (owing to conditions of environment which might easily be removed) is but remotely connected with human potentiality. And upon such insufficient and inaccurate data the science of eugenics is based. It is high time we ceased theorizing about Scientific Physical Education and made it a living force, based not upon sentiment or æsthetic convention, but upon observation, analysis, reason, and—last but not least—on common sense.

There will still be authorities upon the subject who will take refuge in the general statement that the muscular fibres of a girl contract with less force than those of a boy, owing to innate sex difference. Muscular activities are common to animals and human beings. If there be any such thing as sex superiority in muscular contraction we shall find it amongst animals as well. Is it capable of proof that horses run faster than mares? Are only dogs used for hunting? Are only dog-foxes hunted, and because of their superior speed? More homely examples are within the reach of all. Seriously, the statement as to sex difference in muscular contraction cannot be substantiated. The word "strength" has undergone much the same distortion of meaning as the phrase "muscular development." It should mean power to resist the strains of existence: instead, it has become a synonym for weight lifting. The very term "strong man" implies something out of the ordinary, something which is neither man nor superman. But even taking strength in its accepted sense, it is beyond all doubt that convention and environment place more restrictions upon that of the girl than of the boy. In the face of such a lack of equality of opportunity it is impossible to make a statement as to ultimate inferiority or superiority. It is no longer possible to beg the question by asserting a difference. At present there is not sufficient evidence to show that—given equal opportunities of development—girls are physically weaker than boys. The work of providing such opportunities lies in the hands of those responsible for Physical Education. They might begin by separating æsthetic convention from scientific fact. They could render the nation an invaluable service by comparing the physique and the garments of the "Venus of Milo" and the "Girl starting for a Race," both of them Greek statues of a good period, and from the latter evolving in their daily work a new ideal for the Northern woman of to-day.

Note.—The best clothes for gymnastic lessons and running games, such as lacrosse, hockey, or football, are the same for both sexes: a shirt or sweater, shorts, and stockings fastened below the knee. The eye is so accustomed to them that they have now become a games convention, and they arouse no more comment when worn in a gymnasium by a girl than by a boy.

CHAPTER VII

SEX-EDUCATION IN SCHOOLS

MEASUREMENTS are not entirely to be relied upon in tracing the processes of growth—they are only valuable when taken together with other data. Some authorities insist, for example, upon the use of a dynamometer, to test the power of the flexors of the fingers, of the adductors of the knees, and so on, and from this deduce some conclusion as to the nerve power controlling these muscles. To be complete, however, the process must be carried much further ; tests should be made as to speed of response to stimulus (e.g. as to accuracy and co-ordination of eye and hand in spotting moving dots on a revolving drum), as to rate of pulse, etc. Whilst not denying the value or interest of such data, I am inclined to think that if such a system of testing be in any way complete, it may tend to direct too much attention to physical states, and morbid curiosity is an undesirable thing. The child may become over-interested in its symptoms, and experience gathered from the treatment of specially nervous boys, in whom such interest was too strongly marked, leads me to avoid as far as possible any undue self-consciousness. A parallel case of everyday occurrence is the amateur motorist who cannot leave well alone, but is constantly meddling with his engine and its fittings. On the other hand, the vast majority of both children and adults grow up in such ignorance of their bodily needs as to approach the other end of the scale, that of the driver who has no idea of anything below the floor-boards of his car. The best results are gained by the man or woman who knows enough to keep the engine running under fair conditions at as constant a number of revolutions as possible: this demands some knowledge of the power-unit, not an expert but a working knowledge.

Somewhere between the two extremes of untouched innocence (i.e. ignorance of all or almost all the processes of life and growth) and of morbid and precocious knowledge there lies a sane and healthy acquaintance with bodily needs. It is this which any school should give as part of the regular curriculum to each child. Physical education depends not alone on the gymnastic teacher: it depends also on the class teacher; more largely it depends on the knowing co-operation of those who are being educated. There is no hidden mystery in the working of the bodily machine: a simple course in anatomy and mechanics would be of absorbing interest to children, who can be so tremendously keen on engines. The desire of the average child and adult to be and to keep fit and well is an interest which it is nothing but loss to neglect. The subject is one which is as necessary to life as that triple brass of education, the three R's, and a knowledge of it would be of infinite help both to the staff of a school and the children themselves.

Here, however, one is confronted with a grave difficulty. Whilst every one will agree that to go out in the wet in house-shoes is a crime which should be prevented, because it leads to a cold, and in a community a cold is a public nuisance and a cause of deterioration of work, by no means every one is agreed that definite sex-education is necessary or even desirable, and to many the subject is as a red rag to a bull. To beg the question, to say that such things are for parents to teach, to protest that the destruction of innocence is a terrible mistake—none of these courses is of the least practical use. Whilst admitting that the difficulties in the way of such instruction appear enormous, variable, and—to some—insuperable, we cannot disregard the fact that to omit all reference to the development and uses of sex is to sacrifice many to the convenience of a few. No one will deny that the question has its difficulties, and that many children are left to struggle with them by themselves, to climb as best they can out of a morass of misunderstanding, or to pull others into it—a process which too often takes far more than the period of their school life and extends even beyond the periods of engagement or marriage. It is impossible not to feel that in any school there are young growing things who are faced with a problem to which, at first, they may find no solution or an incorrect one: on the staff are adults who have faced the same problem and solved it to a more or less accurate number of decimals. At least, they have found a practical working value for *x*. If a school is to enable children to fit themselves to meet the needs and discharge the obligations of life, it seems a plain duty to give them all the help possible to this end. The adult has the knowledge and experience, the child has the need. Most men and women will admit that timely help would have enabled them to solve the problem more easily. There can be no doubt that the need is there: the difficulties in the way are not insuperable; they are difficulties of adjustment of detail. The subject may be dealt with differently in day- and boarding-schools, but the facts to be dealt with remain the same in both. It is impossible to lay down hard-and-fast lines of procedure: it may, however, be useful to indicate the general direction such lines might with advantage pursue.

1. The body is a machine, and must be kept in good running order if good results are to be obtained.
2. General outlines of its mechanism, providing for—(*a*) movement, (*b*) oxygenation of blood, (*c*) digestion.
3. Growth of the body.
4. Nerve control of muscles, outline of nervous system, formation of bodily habits.
5. Generation and prenatal life.

In a boarding-school which children leave at about 17 to 19 years of age this course should finish long before they go. During the course obvious connections will arise with existing activities, such as artificial respiration in a swimming course, first aid in an ambulance course, etc., the biology syllabus, the chemistry course. These are only matters of arrangement. The time at which such a course should begin is more difficult to fix.

Looking back over a number of years' experience in boarding-schools, one sees a vast mass of material which needed handling, and which was never dealt with on any organized or definite scheme. Rowdiness, over-excitement, over-stimulation owing to unsatisfactory diet, over-fatigue from an ill-arranged time-table, lack of sleep, dormitory troubles, expulsions from school, unsatisfactory ill-disciplined children, badly arranged premises, ignorance of bodily needs, the influence of older on younger children, undesirable conversation, so-called vice, a whole side of life in itself pleasing and clean and honourable thrust into a dark corner and left to decay whilst those responsible lament the dolorous smell—these things are a commonplace to every teacher. If physical education is to be worthy of the name, it must ultimately organize a method for dealing with the natural growth of which these things are but distorted symptoms. Those who leave the commencement of such a course as I am advocating until the age of puberty commences, will from time to time be confronted by children—not congenitally abnormal—who need such education even before the age of 9 or 10. The time to begin will never be later than 12 or 13, and may often—especially in day-schools—be earlier than this.

The person ultimately chosen to handle the subject will be confronted with a need of text-books. A sufficient knowledge of anatomy and physiology and of education, coupled with as wide an experience as possible of life, is the soundest basis upon which to build. No text-book with definite lessons can meet the case: the handling of the subject must depend upon the special needs of the taught and the special abilities of the teacher. Such a series of books as *What a Young Man Ought to Know*, etc., is worse than useless. The attempt to issue information in popular form fails because of its hesitation and lack of directness in handling the necessary material. At the other end of the scale comes *Die Sexuelle Frage*, by Forel. The completeness of this is obtained by the inclusion of pathological and abnormal cases, which may not be useful enough to the average person to justify their place in the book. The possible undesirable consequences of the study of such symptoms by those who have not a sufficient basis of sanity or common sense are, however, not more harmful than the sickly sentiment and the quasi-religious atmosphere of many of the more elementary books. The connection between sex and certain forms of religious emotion are a commonplace in the history of mankind. Except in the hands of a teacher of religion of more than average knowledge and experience of humanity, the mingling of religious and sex instruction is certain to prove unsatisfactory and dangerous. Whoever is in the end chosen to handle the subject, the way must be prepared by a clear, simple teaching of the mechanism of the body, a teaching given as an ordinary part of school work, exciting no astonishment or remark just because it is ordinary. The idea of reverence of the body has been exaggerated, and in dealing with this subject exaggeration of any kind is to be avoided. The body is a very necessary machine which enables the personality inhabiting it to move from place to place, to come in contact with new things and persons. It combines with other advantages those of a bicycle and a lift. It is the sole means of communication between the ego and the outside world. These are all useful, but that they are or should be objects of blind reverence is open to question. There remains the power of reproduction : this is akin to the attributes of the Creator, and as such is entitled to more than respect. The creation of children is, however, only one form of self-expression : to exalt it into a kind of religion, to assert that parenthood changes and deifies those who perform these functions, is to overstate the case and to under-value the products of such other forms of expression as sculpture, literature, music, or painting. Parenthood is as much a bodily function as digestion or respiration ; to exaggerate its claims, to wrap it round in secrecy, sentiment, and ignorance, is to court disaster. The history of mankind is bound up with the development of religion : if we are to worship parenthood let us at least know what it is. The more ignorant the savage, the more brutal and superstitious are his religious observances. With increased knowledge and decreased confusion of ideas there comes a clearer conception of good and of God. The greater the knowledge of the processes of life the clearer will be the conception of the creative power of mankind, the greater the respect or reverence in which it is held. But the knowledge must come first : it is this alone which can be given to the taught by the teacher. The use made of it must for ever remain in the control of those who receive it. Some of the more obvious forms of error will, however, be avoided if a hard and clear line be drawn between religious and sex education, and if such simple things as the time of the lesson be carefully thought out. A dormitory—after or before lights are out—is no place for it.

There remains another question, the sex of the class and of the teacher. To avoid difficulty, boys will probably be taught by men, and girls by women.

The nature of the subject is, however, such that some very definite amount of co-ordination of the two sides of it should be ensured, otherwise the remedy will be worse than the disease. Whatever line is adopted, it must only be after a full and definite discussion between teachers of both sexes. Here there arises a further problem: once it is recognized that the present misdirection of sex-activity is due to the veil of secrecy which has always been drawn around it, it becomes necessary to decide on some teaching which shall deal with sex as a whole, not as two parts to be separated. The members of either sex must have some knowledge of the problem as it presents itself to those of the other. To teach boys or girls one side of the equation only is to prevent them from solving it, and to add still further to their difficulties.

To sum up, definite and simple sex-education is both desirable and necessary. It must be based on or connected with simple lessons in anatomy and physiology. It must be handled only by teachers of wide experience and proved educational ability. It must be given a proper place in the time-table, and not left to any odd hour. It must be clearly separated from sentiment and religion. To be effective it must not be mono-sexual. Finally, and most important, it must rest upon and derive its authority from the consent and sympathy of the parents. There are those who think that parents are the suitable teachers. If they are, and when they have chosen to give such teaching, it will have been given before the age at which the school will deal with it. If in the school it is properly handled, and there is no use (but much danger) in it if handled improperly, there will be no harm in those who have already learnt something of it revising and adding to their knowledge. If such teaching has not been given at home, the school must fill the gap, for a reasonable physical education can no longer tolerate the waste of energy, the misuse of strength, the blunting of some of the best of human feeling and thought, the indistinct and hazy ideas of right and wrong which label as vice what is no more than a mistake. A teacher of chemistry or engineering has no false modesty to prevent the correction of a mistake which may lead to an explosion or the failure of a machine. We have passed the day in which it was held wiser not to translate the Bible into a tongue understanded of the people. When we begin to deal with what we prefer to call the secret of existence, which in reality is no secret at all to the average boy or girl of twelve or fourteen, we shall find that most of the difficulties are ghosts of our own making, and we shall illuminate properly one of the darkest areas of human ignorance and carelessness.

Note.—A proper Physical Education provides both theory and practice. The theory comprises (1) elementary anatomy, which arises naturally from and through the gymnastic lesson; (2) some physiology, beginning with circulation, respiration, digestion, etc.; (3) hygiene, or keeping the body fit and well. I find that a year's course of one period a week can be arranged so as to give the outlines of these things, and lead naturally up to the processes of brain control. During such a course questions from the class and the teacher's explanation frequently refer to the main problem of separate individual existence: the necessity for special teaching of sex facts recedes, and a gradual acquaintance with the subject grows up. At the end of the course, not at the beginning, come lessons on cell life and cell development, single and double. The friendly acquaintance with growth and physique due to the former lessons, the enormous and living interest in the subject, the respect for the beautifully contrived mechanism which composes the visible body of each member of the class, all tend to produce a favourable opportunity for examining what is after all the natural sequence of the course—growth from the earliest stages. Practical dissection demonstrations on various animals during the year's work will have familiarized the class with some of the stages of growth and the conditions necessary for it. Shorn of false modesty, of emotional nonsense, of everything unnecessary, the prenatal stages of existence present no difficulties other than those of simplification and presentation, the ordinary technical difficulties of teaching. The dread of the complications and dangers of the subject ever present to the minds of earnest reformers is shown by practical experience to be unfounded. The theoretical side of Physical Education may without difficulty be taught to mixed classes, when treated in this way. Such a course in every school, culminating when desirable in direct individual instruction in sex hygiene to those leaving school, will cut through the roots of the upas-tree of secret disease which at present overshadows civilization.

CHAPTER VIII

TOWN LIFE AND PHYSIQUE

LIFE to-day has more of strain than life a hundred years ago: we are tempted to think that at some distant period existence flowed on like a broad and placid river, and to envy the countryman who

> Sweats in the eye of Phœbus, and all night
> Sleeps in Elysium . . .
> And follows so the ever-running year
> With profitable labour to the grave.

Yet we know that Elysium to-day is probably a low room with only one small window, and that the profitable labour produces sixteen to eighteen shillings a week. Hard work, low wages, and lack of interest drive people to towns to live, until three-quarters of the population live in towns or near them, on and round the lines of trams or trains which take them to work. Town life begins where household arrangements are subject to the needs of office, mill, or shop. It is not in itself bad. The houses, even in a row, and very ugly, may often be more healthy than country cottages. With good sanitation, good wages, and good water supply, it may have advantages over rural life. The air on Saturday afternoon or Sunday may be quite clear and good: what makes it unfit to breathe during the week is that any manufacturer or owner of a chimney may—for all practical purposes without restraint—befoul it with the by-products of incomplete combustion. If he so soiled the milk supply he would be treated as a danger to the community: yet air is even more necessary to the community than milk. Coal passing up a chimney unburnt is so much direct loss to the firm; yet, perhaps, it pays better to lose it than to make it worth the while of a skilled man to stoke the furnace. Knowledge of his boiler, of the varying grades of coal he gets, a deft hand and a strong arm, make his no unskilled labour. It should be possible to see a group of chimneys pointing upwards without their hell-cloud of destructive waste pouring out and fouling everything to leeward of them. Yet at present it is but a theoretical possibility. An occasional inspector may persuade the authorities, who perhaps draw their livelihood from similar nuisances, to inflict a nominal fine, which will cause the works-manager less discomfort than a piece of grit in his eye, and his shareholders none at all. In the future an inspector may ride over the town in an aeroplane through a clear sky: at present the smoke nuisance is one of the worst contributions to the rubbish-heap of carelessness which smothers the town dweller.

Small towns are not better than large ones; they are only easier to leave. Carlisle has open fields round it, and fresh air from the sea: it has also many narrow streets and pawnshops. York has architecture and a river, and is small enough to get fresh air in quantities: two cities in one, it has its railway station and vast sidings. It should combine the advantages of town and country, yet Mr.

Rowntree finds poverty and disease there too. The Nidd, the Wharfe, the Aire, the Calder, and the Don all rise in the hills and flow clear and sweet for miles, till they begin to rival the Irwell and the Irk, which flow side by side in the same channel past a black cathedral, stained with different dyes. There are towns more or less centred round one trade, like Sheffield, Coventry, or Oldham: there are new towns such as Barry. There are old cancerous growths like London, drawing in good lives and devouring them: there are fresh towns springing up near country factories with "railway facilities." In places many small towns spread and link themselves together: there is one town from Manchester to Liverpool, and one from Manchester to Leeds, with some fields. And there are Blackpool, Scarborough, Margate, Harrogate, and Weston-super-Mare—"health resorts." That health should be so unusual as to excite remark is a striking criticism of modern life. Yet towns where summer ends and leaves fall early in August, where tons of sludge are taken from the roofs of factories every year, leave something to be desired as human homes. And for most of those who live in them there begins each day the struggle for food and warmth, the fight for existence, the fear of illness.

Most drawbacks to life in towns are the result of carelessness: it is the artificial, the unnecessary disadvantages which render it unwholesome—the foul air due to smoke, the nerve-wearing noise of carts and trams, the uncontrolled dust in the streets, with its filthy consequences, and the tragic apathy of a community which has come to regard slum property and hunger as necessary consequences of civilization. (It is not merely the manufacturing town which has a monopoly of noise: Florence is worse than many parts of London.) There is something infuriatingly unnecessary in the recurring bump of a tram-wheel on which bad braking or the slime of a foggy day has worn a flat. Some corporations possess a special noise-machine used only at night when the tram-service is ended—a heavy weight on wheels which grinds the worn rails smooth again, twenty or thirty yards at a time. There are tube railways in London and the Métro in Paris. In many towns there is the motor lorry, rattling over granite setts a train of loaded wagons once intended for horsed traffic, shaking loose every chain and bolt and nut, and shattering the nerves of the pedestrian. There are hundreds of expensive elementary and other schools and institutions built on a main road, or even near a railway, where ventilation is impeded because of noise. Their only hope lies in the perfection of the petrol engine, or a development of steam traction with its soft exhaust, and an advance in road-making. It is a far cry to the day when rubber—synthetic or natural—will be on the roads instead of on the wheels, though some years ago a grower told me that but for combines and speculators it would be possible and economical even now.

For dust, we have paper whirled about in the wind, uncovered carts with straw flying out over the tailboard, fine shavings from packing-cases, the shapeless and nameless waste of shops, the loose surface of wrongly designed roads, and a thousand other impurities. Perhaps the most unrivalled example of carelessness is an area opposite a magnificent new infirmary. On the other side of the road is an open space, covered with some gritty substance. After a few dry days this is easily wind-borne; every passing tram or taxi raises a cloud of it, tosses it in the air, and spreads it about over the front of the building. Yet even this would be worse were it near open shops containing food.

The essential drawbacks of town life are unimportant: its unnecessary discomforts add up to a weight which the human machine is not calculated to support without injury. The strain is already too great for some. The labour market is overcrowded. I once asked a manufacturer employing some three hundred hands what effect their improved physique would have on his trade. Would it be to his interest to have them entering his works young and fit, with a prospect of good health, good wages, and more or less permanent employment? As a friend he gave me a very frank answer, which, he said, he would not care to repeat on a public platform in his own town. "It makes no difference to me. When they get set, and go on in a groove, they get careless. It pays us to work them out and get fresh hands. People are cheap, and there are always more than we can employ."

The human body is the cheapest machine in the world, until it breaks down and has to be kept running: then it is one of the most expensive, either to its owner or to those who care for it and do not wish it to be scrapped. Cheap, because there are so many. It is not only at the docks that there are often two men looking for one job. Those who are unemployed lower the wages of those at work, until all carry on the struggle for those necessities of life—food and shelter—upon a narrow ledge between the chasms of supply and demand. Anxiety, mental strain, physical and nervous weakness, irregular hours or insufficient meals, a lessened power of resistance, a general lowering of vitality—or unemployment, hunger, debt, worry, and a lowered vitality—whatever the chain of events may be we come to the lowered vitality in the end. And then, a sudden change in the weather, an unexpected east wind, shoddy clothes, cheap boots with rotten soles, the rain, the adulterated food, long hours of work, even the stuffy train or tram, the badly ventilated office or the sweating boiler-house, the shed with the legal amount of humidity in the atmosphere, the gritty air of an ironworks or the pestilent dust of the streets—any one of the evils which *per se* have no essential connection with life in towns, but are only carelessness or the result of the individual greed of an employer or the slackness of an employee, or the low standard of the community for communal hygiene, proves too much for the lowered vitality, and the weakest part of the body gives way under the strain. The individual with the best vital capacity will be the least liable to collapse.

The power to resist these and similar conditions can be vastly increased during school life: the sense of responsibility for such conditions, and of intolerance of them for oneself and for others can be developed during school life. What means are at present employed to attain such an end?

CHAPTER IX

THE PRESENT STATE OF PHYSICAL EDUCATION

SINCE the first condition of classroom life is the negation of movement, the school must attempt to counteract the effects of such a condition. This, however, is not the only aim of school-directed exercise : the prevention of harm from continual restriction of movement is, after all, a zero, though an absolutely necessary one. If it is present, it increases the value of other exercise, and vice versa. Growth and health for the average child must be ensured as well : the child below the average of development must be raised to the normal level. As in later life a certain minimum of pence per week is necessary, if a human being is to preserve decency and health, so in school life a certain minimum of exercise must be provided. I have stated elsewhere my reasons for insisting that this minimum is three lessons a week of half an hour each.

In considering present conditions, it is simpler to keep to the place-classification suggested in Chapter I, page 11. Extending the term "playing-fields" somewhat, the following arrangement will cover the ground :—

PLACE.	OCCUPATION.
1. Playgrounds and Playing-fields, etc.	Games and Organized Play.
2. The Gymnasium.	Systems of Specialized Movement (gymnastics, dancing, etc.).

I have dealt very fully with the question of "Physical Recreation for Elementary School-children out of School Hours" in a "Report on Organized Play at Home and Abroad," published by the National League for Physical Education and Improvement, in which are classified the aims and objects of the various societies engaged in this work, and the means they employ for their attainment. Broadly, their object is to provide occupation, relaxation, and exercise out of school. So many of them, however, lay stress upon one or other form of "drill" that there is a grave danger that responsible authorities may consider that the "drill" thus obtained fills the gaps in the scheme of exercise provided during school hours. This is very far from being the case, for physical education and "drill" are very different things. Whilst recognizing the undoubted service to the children, and through them to the nation as a whole, done by many of these associations and societies in assisting to fill up the gap in the State educational system (by giving the children something to play and somewhere to play it), it is impossible not to regret that private enterprise here, as elsewhere, has wasted strength by overlapping, by lack of co-operation, and most of all by misunderstanding the fundamental fact of the proposition before them. A résumé of the "objects" of the various organizations would show how, though all recognize the need for action, each is tempted to ascribe it to various causes. One laments the lack of thorough religious teaching, another is anxious to keep the children as members of its own Church, another wishes to promote a particular form of exercise, another to inculcate obedience by military discipline—still another to develop character by discipline which is everything except military. Splendidly as they have worked, they would have done better to recognize that the want which they in their various ways seek to supply is not religious, not military, not sectional, but educational. They have, however, done magnificent work against enormous odds, and brought no little happiness into the drab lives of numberless children. Their work forms a valuable addition to the physical activities of the school.

Games are so much a part of our national life that we are inclined—those of us who have been used to them at school—to consider cricket and football as "national." In public and preparatory schools they claim a large share of the time-table, and many day-schools make a great point of them. But when they are considered from the point of view of exercise for the children of the nation, boys and girls alike, some revision of this vague and generally-accepted view of them is necessary. They need so much space that—for the vast majority of children—they are beyond reach. To provide sufficient acreage—and means of access to it—for the children of London, Liverpool, or Leeds to play cricket or football would cost more than the community could afford. Even Eton is not too lavishly supplied with playing-fields. A moment's comparison of the magnificent space available there with that of the ordinary school in the ordinary town will make the point clear. If sufficient and proper exercise and movement is to be provided for the children of the nation, it must be elsewhere than on playing-fields, for, for most of them, the national games are impossible. Wherever possible, games should be provided, for their effects—other than developmental—are so generally recognized as to make the effort to obtain them justifiable.

There remains the gymnasium—the space in the school devoted to exercise and movement, of whatever kind or system. A school is always a place in which too much has to be done in too little time, and generally with too little money ; consequently, we may expect to find—as indeed we do find—specialized movement in the ordinary school restricted to a small number of minutes a week, and often (if not generally) carried on with insufficient apparatus.

The question of apparatus is of the first importance. It is customary to state that apparatus is not necessary for a gymnastic lesson, or that Swedish gymnastics can be carried on without it. I have no hesitation in saying that, the shorter the available time for the lesson, and the larger the number of children in the class, the greater is the need for apparatus if any real correction of the classroom position is to be hoped for. To expect a teacher to obtain a fair percentage of result from a lesson without apparatus is as unfair as to demand the solution of a long problem in mathematics upon one very small sheet of paper—or an experiment in chemistry with insufficient laboratory equipment. It is as though a French lesson had always to be given without books. I am not disregarding the nervous and "control" value of free-standing exercises : in their place in the lesson they are invaluable. But to make a lesson consist entirely of such movements, or to rely entirely upon human support as a makeshift for apparatus, is often to render the lesson dull and ineffective. It is the attempt to do this—with partially trained teachers—

which has caused the Swedish system to be considered uninteresting—if not worse.

The apparatus used makes a sharp division between the various systems. In the so-called German gymnastics the horizontal bar, parallel bars, and a horse with a spring-board and many mats, are employed. (Ropes and climbing apparatus are more or less common to all systems.) One great disadvantage of the single or double bars is that, as a rule, only one person can work on them at once. This makes their effective use in schools impossible. There is, however, a still more serious disadvantage : both horizontal and parallel bars demand that the weight of the body be supported in large part by the arms and the shoulder-girdle. The position of the latter is already distorted by the desk-position : any undue strain tends to distort it still further, and in any case the strength of the shoulder-girdle is not such—in relation to the body-weight—as to render over-exercise of its muscles desirable. With the horse, neither spring-board nor mats should be used : the former lessens the development of jumping power, the latter tend to lessen the reliance upon individual control, which is one of the objects of the lesson. With a suitable floor neither is necessary, except in very special cases. For the ordinary lesson of an ordinary class they should be dispensed with.

In German gymnastics the exercises are suited to the apparatus : one learns the horizontal bar or parallel bar exercises. The apparatus and the exercises of the Swedish system are suited to the needs of the individual, and can be made to provide the maximum of movement for a fairly large class in the minimum of time. The class should not be so large as to render it difficult for the teacher to see and correct faults: twenty to twenty-five children will be quite enough. It is unnecessary here to enumerate the divisions of a Table of Exercises. They are sufficiently clearly laid down in the Board of Education Handbook, and are too generally known to need repetition. The lesson provides for the suitable exercise of a class, with some possibility of meeting individual needs. It, and I include under the same name what is sometimes called Danish gymnastics, is the only system of specialized movement based upon a knowledge of anatomy and physiology, and aiming directly at securing normal and healthy growth. Special needs of individuals must be treated alone or in pairs: the system provides amply for this. Experience of both Swedish and German gymnastics, both in my own body and in teaching others, convinces me that no other system of specialized movement can so quickly and so simply provide so much exercise (both corrective and developmental), or exercise so capable of variation to individual needs as the former. By its means one may hope to combat with some success the ill-effects of classroom life. The minimum time per week needed is **three lessons of half an hour's clear work each**—special treatment of individuals is additional to this.

There is no British system of gymnastics or physical training.

Any review of movement or exercise would be incomplete without a reference to dancing. It is an invaluable addition to any series of lessons in gymnastics. Always remembering that growth and health are interfered with by classroom life, it will be agreed that both must first be secured by the provision of sufficient scientific physical education. Dancing alone cannot and indeed does not attempt to correct the changes, e.g. in the upper part of the chest, which are directly caused by a school desk. It is conceivable that a school conducted upon the Montessori system, in which freedom of movement is not impossible, and including Eurythmics as one means to physical, mental, and artistic development, may provide the perfect education. It could not fail to approach it very nearly. But for the school of every day, dealing with vast numbers of children, with staff and time-table hopelessly overloaded with work, some other solution must be found, if only for a time and until a better one be possible. Special schools may be fortunate enough in conditions of work to be able to show what may be done in this direction: for the ordinary school something simpler must be found. For a "free-time" occupation, or as an adjunct to the gymnastic lesson, dancing of any kind is most valuable. The revival of country dances and the development of Eurythmics render the outlook here most promising.

Note.—In considering Eurythmics as a form of dancing, I would point out that it has other and wider claims to educational consideration. By the courtesy of Mlle. Lydie Malan of the Conservatoire of Geneva, I am enabled to quote from what I consider to be one of the clearest and most comprehensive statements of its purpose at present available, viz. a Report to the International Congress of Women, Rome, 1914, which she has kindly allowed me to translate for her.

"'Based on an experimental analysis of the relations of time and space, it develops the muscular sense: its object is to re-establish the natural rhythms of the body and to create in the brain definite rhythmic images . . . to establish rapid means of communication between the brain which commands and the organism which realizes. The object of rhythmic gymnastics is to realize by means of the body the being which is within.

"It consists of two parts, educational and plastic. The first forms the elementary base of all artistic education: it is a kind of 'physical theory of music' enabling the pupil to feel different musical values by means of the muscles before knowing them with the intellect." (Here follows a very clear summary of the method employed from the earliest lesson onward.) "Once they have grasped musical values the pupils proceed to the realization of a bar, by known movements. The progression is then increased . . . so as to obtain gradually a complete phrase, the expression of a thought. From 'realization' we pass to 'improvisation.' When the pupil is able to feel a melody, i.e. to hear a single voice, we ask him to hear and realize two at the same time. In this way we obtain double and triple rhythms (the foundation of musical counterpoint). . . . Eurythmics forms a method of education in art as a completion of human education. It aims not at external grace, but at realization of an inner personality."

To sum up. If we compare the present state of Physical Education with that of any other branch of education in elementary or public schools, we are faced at once with an extraordinary condition of affairs. In most departments of mental education there is to begin with a common sum of knowledge, and a definite standard of attainment which may reasonably be expected from students at various stages of study of the subject. There are those who are still at school, those who teach them at school, and those who train the latter to teach. There are all kinds of intermediate stages between the beginner and the research student, but for each stage there is a fairly clearly defined expectation of attainment, and at each stage—once the subject has been recognized as worthy of a place in the time-table—students are provided with the material necessary for their studies. In a word, the whole educational organization is at the service of the student. When we consider the Theory and Practice of Healthy Growth, we find that—in the first place—it is not one subject, but the very foundation of all subjects, a foundation which gives support to the whole edifice of education and of life. Its effects are felt in every classroom at school and in every piece of work done in adult life. In theory we have recognized its value as a department of study; in practice we are unable to decide what method of teaching should be followed, or what standard of attainment to expect from teachers or taught. It is the bounden duty of every school to develop the physical as well as the mental capacity of the child to the full, so that it may pass into the world as far as possible a complete human being: yet we sacrifice—not deliberately, perhaps, but none the less effectively—the physical to the mental. We close the classroom door and at once forget the body's need of growth: we compel large numbers to sit still whilst "learning lessons." Is it any wonder that mental work suffers in consequence? We then to the best of our ability seek to remedy the harm we have done—by games, by dancing, by gymnastics, by all sorts of exercise given by all sorts of individuals or societies, at some expense, and naturally with some waste through overlapping effort. If, however, we first of all realize that " national " games are not possible for most of the nation's children in sufficient amount to provide growth and health, that games are not necessarily corrective—particularly for those who do not play them very well, that the processes of growth must be studied before they can be effectively controlled, that physical and mental education are not to be acquired in watertight compartments, that the present conditions of school life render some form of specialized movement imperative—not only in order to prevent harm, but to do good—we shall not find it difficult to decide what is the irreducible minimum of time which must be devoted to this subject, what the standard of attainment to expect, and what the capability and the training of the teachers responsible for the work.

CHAPTER X

THE FUTURE OF PHYSICAL EDUCATION

To produce proper results, Physical Education must claim from the time-table of each school three periods a week for every child, periods of half an hour's clear work, regardless of time spent going to or coming from the class. This means two hours a week to be obtained somehow from other subjects. In other words, the specialists responsible for other subjects must agree that they will sacrifice the necessary time between them. This they will not do unless they are convinced that the time thus given up will not be lost. In other words, they must realize the needs of growth and health. The work done during the three lessons must be in the hands of teachers who have made a special study of the subject. Their number will be fixed by the number of children they can satisfactorily handle, and I think it will be found that one hundred children will be the utmost one teacher can undertake. This will give a rough estimate of the amount of work to be done in this branch of education. Also, every school must have a room or space devoted to physical education, not a classroom or a central hall or a room used also for dancing. The room used as a central hall is merely an enlarged corridor, and the dust and dirt in it make it impossible as a gymnasium. The dancing floor has to be more or less polished, and cannot give the firm support for the feet required for accurate movement. (The floor is the most important piece of apparatus in a gymnasium, the one most used in most exercises.) Some other simple apparatus will also be necessary. Surely it is not too much to ask that the places which will in reality be laboratories of public health shall be simply and effectively equipped.

The problem is thus one of finance, of adequate staff and of their training. There are in existence valuable training centres for gymnastic teachers, but they devote attention more to gymnastics than to education. There are also training centres for teachers, but they devote attention more to education than to gymnastics. This divorce of mental and physical development results in a loss of effective work in both. While the gymnastic teacher must know something more than a little of general education, the class teacher must know enough of physical needs to facilitate a drastic change in the methods of handling classes. It is at present in the classroom that most of the harm is done. Without effective co-operation between the two branches, education suffers as a whole. The problem will not be solved by the reintroduction of specialists in military drill into the schools. The handling of children is a matter for those trained in education.

A satisfactory solution of the question will be seen more clearly if the main subjects of study necessary to a proper training in physical education be stated. Knowledge of the laws of education is of the first importance. Next come the construction and mechanism of the body, its possibilities of movement, the relation of movement to growth and nourishment, the means of avoiding or correcting the changes consequent upon position. A course in drawing from life, and of modelling from the figure, would also be of great value. Failing the organization of a State-aided centre of physical education such as existed a short time ago at Ghent, the only places where such training can be obtained without expenditure too enormous for private means are the universities.

The recognition of physical education by a university as a necessary and vitally important part of the work of a school would at once raise the subject to a position far above its present place. It is strange how even those who are acquainted with ancient ideals of perfection have come to forget its claims. That they do forget them is sufficiently proved by the amount of school time they are prepared to yield it from the study of their special subject.

Most hopeful for the future is the situation of some of the modern universities in the centre of a vast population. Surrounded by many thousands of children, with good railway and other communications, and a consequent simplicity of organization, with a constant stream of the better output of the schools passing through their departments and obtaining special training, to flow back again into the schools and make them more efficient—with every facility for special study, and with the need for increased vitality at their very doors, they already possess the necessary organization for the training of teachers. They have also practising schools. In some cases they are able to draw upon the financial aid of the community in which they are placed for the organization of new subjects. There is none which can give them a more certain return for their expenditure than the Theory and Practice of Physical Education.

The subject is not one which can be left to the latter part of a year's course. Whilst forming a necessary part of the studies of the ordinary class teacher, it needs more specialization on the part of those who will ultimately have to organize the work in a school. It should not be impossible to co-ordinate the studies of candidates for a diploma in education so that they should be able to offer Physical Education as a special subject. The need for such a change has been pressing enough in the past : in the future every effort made to improve the physique of children will be of infinite value.

Any such course of study should include as a regular branch either dissection or lectures from anatomical preparations. A slight theoretical knowledge of surface anatomy is not sufficient. Access to the dissecting-room in the Royal Central Gymnastic Institute at Stockholm was an invaluable part of the training.

The means necessary for the better organization of Physical Education already exist in the universities. All that is needed is the regrouping of studies so as to permit students for a diploma in Physical Education to obtain fuller training in the subjects required. It will be wise to raise the standard of attainment in this subject in the present diploma courses, as well as to facilitate specialization for a separate diploma in it. Better results would be obtained if the diploma were granted only after a year's actual teaching in a school, and not immediately after a course. It could be made to depend upon a report from the head of the school, coupled with inspection during the year's school work, and a further examination (preferably *viva voce*) by the Professor of Education and the Director of Physical Education. Successful candidates would be granted a diploma in Physical Education, unsuccessful ones would be allowed to retain the certificate which would have been granted at the end of the training course.

No branch of study will be more urgently needed in the immediate future.

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